

COMMAND AND GENERAL STAFF SCHOOL

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COLONEL F. M. BARROWS, *Field Artillery*.....Editor
CAPTAIN JOSEPH DASHER, *Infantry*.....Assistant Editor
LIEUTENANT DON E. GRIBBLE, *Field Artillery*.....Assistant Editor



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Mission

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The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a section of "Foreign Military Digests."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This *Review* is published as a guide to modern military tendencies and to inspire vigorous thoughts on the subjects treated.

The opinions expressed and conclusions drawn in articles are *solely those of the authors and are in no sense official.*



Acknowledgement

The editors desire to express their thanks and appreciation to those persons who have valuably assisted in the preparation of material for this issue. The work of contributors has been done in addition to their regular duties and gratuitously on their own time. We are very grateful to the following officers for their generous donations:

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|-------------------------------------|---|
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| LIEUTENANT COLONEL J.H. RIEPE | <i>Some Thoughts on the Motorized Division</i> |
| MAJOR W.R. KREINHEDER | <i>The "WAACS" Are Here</i> |

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Contents

| | PAGE |
|--|------|
| LEADERSHIP..... | 5 |
| SOME THOUGHTS ON THE MOTORIZED DIVISION..... | 9 |
| THE FUTURE OF NIGHT ATTACK..... | 11 |
| AN ENEMY STRONG POINT IN THE LIBYAN DESERT..... | 13 |
| OBSERVATIONS DURING THE CAMPAIGN ON LUZON..... | 14 |
| OBSERVATION AVIATION..... | 15 |
| "WE WILL DO ANYTHING TO WIN THE WAR"..... | 20 |
| NOTES ON ESSENTIAL ELEMENTS OF INFORMATION AND INDICATIONS..... | 22 |
| ANTIAIRCRAFT ARTILLERY WITH THE FIELD FORCES..... | 25 |
| JUSTICE IN A WAR-TIME ARMY..... | 31 |
| AGE AND FIELD COMMAND..... | 36 |
| A GERMAN VERSION OF THE BATTLE OF SOLLUM..... | 39 |
| ARTILLERY-INFANTRY COOPERATION..... | 40 |
| MAKE THE MOST OF YOUR PRISONERS..... | 44 |
| LIAISON OFFICERS..... | 46 |
| THE "WAACS" ARE HERE..... | 47 |
| ANTITANK MINES..... | 50 |
| FIELD ARTILLERY IN OFFENSE..... | 51 |
| IF JAPAN AND AMERICA FIGHT..... | 56 |
| IT CAN HAPPEN HERE..... | 60 |
| JAPANESE DISCIPLINE, CONFUCIANIST AND FEUDAL..... | 62 |
| SELECTION OF THE PARACHUTIST..... | 64 |
| FOREIGN MILITARY DIGESTS..... | 65 |
| <i>The German Light Infantry Division</i> | 65 |
| <i>Battle for a Highway on the Eastern Front</i> | 65 |
| <i>Japanese Principles of Antitank Defense</i> | 66 |
| <i>The Retreat from Libya</i> | 67 |
| <i>Propaganda and the Soldier</i> | 69 |
| <i>The Reconnaissance Corps</i> | 70 |
| <i>A Combined General Staff</i> | 71 |
| <i>School for Glider Pilots</i> | 72 |
| <i>Attack of a German Fortified Position</i> | 73 |
| <i>The Luftwaffe — Its Strength and Dispositions</i> | 74 |
| <i>Visit to the Defense District Riding and Driving School</i> | 76 |
| <i>Japanese Tanks</i> | 77 |
| <i>The Ear of the German Army — The Signal Corps</i> | 79 |
| <i>Some Remarks Concerning the Use of Aviation in Combat</i> | 80 |
| <i>Combat in Mountainous Terrain</i> | 81 |
| <i>Some Aspects of Forest Warfare</i> | 83 |
| <i>A Royal Army Medical Corps Hospital in Crete</i> | 84 |
| <i>River Crossing in the Eastern Theater of War</i> | 85 |
| <i>The Ground Defense of Aerodromes</i> | 87 |
| <i>Concerning the Infantry Sapper</i> | 88 |
| <i>Night Battle for a Populated Point</i> | 89 |
| <i>Hints and Suggestions for the Combat Employment of Army Construction Troops</i> | 90 |
| <i>Interior versus Exterior Lines</i> | 91 |
| <i>German Spring Air Tactics</i> | 94 |
| <i>Field Artillery in the Attack</i> | 95 |
| <i>German Engineers in the War</i> | 96 |
| <i>Artillery Support for Tank Attack</i> | 97 |
| <i>Spring Tactics of Enemy Bombers</i> | 98 |
| <i>The Fuehrer's General Staff Officers</i> | 99 |
| MILITARY NOTES AROUND THE WORLD..... | 101 |
| THE SECOND WORLD WAR..... | 108 |
| BOOK REVIEWS..... | 114 |
| LIBRARY BULLETIN..... | 116 |
| DIRECTORY OF PERIODICALS..... | 118 |
| CATALOG OF SELECTED PERIODICAL ARTICLES..... | 118 |
| SUBJECT INDEX..... | 126 |

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Leadership

An Address to Student Officers About to Be Commissioned.

BY
MAJOR CHRISTIAN A. BACH, Cavalry.

In a short time each of you men will control the lives of a certain number of other men. You will have in your charge loyal but untrained citizens, who look to you for instruction and guidance.

Your word will be their law. Your most casual remark will be remembered. Your mannerism will be aped. Your clothing, your carriage, your vocabulary, your manner of command will be imitated.

When you join your organization you will find there a willing body of men who ask from you nothing more than the qualities that will command their respect, their loyalty, and their obedience.

They are perfectly ready and eager to follow you so long as you can convince them that you have those qualities. When the time comes that they are satisfied you do not possess them you might as well kiss yourself good-bye. Your usefulness in that organization is at an end.

From the standpoint of society, the world may be divided into leaders and followers. The professions have their leaders, the financial world has its leaders. We have religious leaders, and political leaders, and society leaders. In all this leadership it is difficult, if not impossible, to separate from the element of pure leadership that selfish element of personal gain or advantage to the individual, without which such leadership would lose its value.

It is in the military service only, where men freely sacrifice their lives for a faith, where men are willing to suffer and die for the right or the prevention of a great wrong, that we can hope to realize leadership in its most exalted and disinterested sense. Therefore, when I say leadership, I mean military leadership.

In a few days the great mass of you men will receive commissions as officers. These commissions will not make you leaders; they will merely make you officers. They will place you in a position where you can become leaders if you possess the proper attributes. But you must make good—not so much with the men over you as with the men under you.

Men must and will follow into battle officers who are not leaders, but the driving power behind these men is not enthusiasm but discipline. They go with doubt and trembling, and with an awful fear tugging at their heartstrings that prompts the unspoken question, "What will he do next?"

Such men obey the letter of their orders but no more. Of devotion to their commander, of exalted enthusiasm which scorns personal risk, of their self-

sacrifice to insure his personal safety, they know nothing. Their legs carry them forward because their brain and their training tell them they must go. Their spirit does not go with them.

Great results are not achieved by cold, passive, unresponsive soldiers. They don't go very far and they stop as soon as they can. Leadership not only demands but receives the willing, unhesitating, unfaltering obedience and loyalty of other men; and a devotion that will cause them, when the time comes, to follow their uncrowned king to hell and back again if necessary.

You will ask yourselves: "Of just what, then, does leadership consist? What must I do to become a leader? What are the attributes of leadership, and how can I cultivate them?"

Leadership is a composite of a number of qualities. Among the most important I would list self-confidence, moral ascendancy, self-sacrifice, paternalism, fairness, initiative, decision, dignity, courage.

Let me discuss these with you in detail.

Self-confidence results, first, from exact knowledge; second, the ability to impart that knowledge; and, third, the feeling of superiority over others that naturally follows. All these give the officer poise.

To lead you must know—you may bluff all your men some of the time, but you can't do it all the time. Men will not have confidence in an officer unless he knows his business, and he must know it from the ground up.

The officer should know more about paper work than his first sergeant and company clerk put together; he should know more about messing than his mess sergeant; more about diseases of the horse than his troop farrier. He should be at least as good a shot as any man in his company.

If the officer does not know, and demonstrates the fact that he does not know, it is entirely human for the soldier to say to himself, "To hell with him. He doesn't know as much about this as I do," and calmly disregard the instructions received.

There is no substitute for accurate knowledge. Become so well informed that men will hunt you up to ask questions; that your brother officers will say to one another, "Ask Smith—he knows."

And not only should each officer know thoroughly the duties of his own grade but he should study those of the two grades next above him. A twofold benefit attaches to this. He prepares himself for duties which may fall to his lot at any time during

MILITARY REVIEW

battle; he further gains a broader viewpoint which enables him to appreciate the necessity for the issuance of orders and join more intelligently in their execution.

Not only must the officer know but he must be able to put what he knows into grammatical, interesting, forceful English. He must learn to stand on his feet and speak without embarrassment.

I am told that in British training camps student officers are required to deliver 10-minute talks on any subject they may choose. That is excellent practice. For to speak clearly one must think clearly, and clear, logical thinking expresses itself in definite, positive orders.

While self-confidence is the result of knowing more than your men, moral ascendancy over them is based upon your belief that you are the better man. To gain and maintain this ascendancy you must have self-control, physical vitality and endurance, and moral force.

You must have yourself so well in hand that, even though in battle you be scared stiff, you will never show fear. For if you by so much as a hurried movement or a trembling of the hand, or a change of expression, or a hasty order hastily revoked, indicate your mental condition it will be reflected in your men in a far greater degree.

In garrison or camp many instances will arise to try your temper and wreck the sweetness of your disposition. If at such times you "fly off the handle" you have no business to be in charge of men. For men in anger say and do things they almost invariably regret afterward.

An officer should never apologize to his men; also an officer should never be guilty of an act for which his sense of justice tells him he should apologize.

Another element in gaining moral ascendancy lies in the possession of enough physical vitality and endurance to withstand the hardships to which you and your men are subjected, and a dauntless spirit that enables you, not only to accept them cheerfully but to minimize their magnitude.

Make light of your troubles, belittle your trials, and you will help vitally to build up within your organization an *esprit* whose value in time of stress cannot be measured.

Moral force is the third element in gaining moral ascendancy. To exert moral force you must live clean, you must have sufficient brain power to see the right and the will to do right.

Be an example to your men. An officer can be a power for good or a power for evil. Don't preach to them—that will be worse than useless. Live the kind of life you would have them lead, and you will be surprised to see the number that will imitate you.

A loud-mouthed, profane captain who is careless of his personal appearance will have a loud-mouthed, profane, dirty company. Remember what I tell you.

Your company will be the reflection of yourself. If you have a rotten company it will be because you are a rotten captain.

Self-sacrifice is essential to leadership. You will give, give all the time. You will give of yourself physically, for the longest hours, the hardest work, and the greatest responsibility is the lot of the captain. He is the first man up in the morning and the last man in at night. He works while others sleep.

You will give of yourself mentally, in sympathy and appreciation for the troubles of men in your charge. This one's mother has died, and that one has lost all his savings in a bank failure. They may desire help, but more than anything else they desire sympathy.

Don't make the mistake of turning such men down with the statement that you have troubles of your own, for every time that you do you knock a stone out of the foundation of your house.

Your men are your foundation, and your house leadership will tumble about your ears unless it rests securely upon them.

Finally, you will give of your own slender financial resources. You will frequently spend your money to conserve the health and well-being of your men or to assist them when in trouble. Generally you get your money back. Very infrequently you must charge it to profit and loss.

When I say that paternalism is essential to leadership I use the term in its better sense. I do not now refer to that form of paternalism which robs men of initiative, self-reliance, and self-respect. I refer to the paternalism that manifests itself in a watchful care for the comfort and welfare of those in your charge.

Soldiers are much like children. You must see that they have shelter, food, and clothing, the best that your utmost efforts can provide. You must be far more solicitous of their comfort than of your own. You must see that they have food to eat before you think of your own; that they have each as good a bed as can be provided before you consider where you will sleep. You must look after their health. You must conserve their strength by not demanding needless exertion or useless labor.

And by doing all these things you are breathing life into what would be otherwise a mere machine. You are creating a soul in your organization that will make the mass respond to you as though it were one man. And that is *esprit*.

And when your organization has this *esprit* you will wake up some morning and discover that the tables have been turned; that instead of your constantly looking out for them, they have, without even a hint from you, taken up the task of looking out for you. You will find that a detail is always there to see that your tent, if you have one, is promptly pitched; that the most and the cleanest bedding is brought to your tent; that from some

LEADERSHIP

mysterious source two eggs have been added to your supper when no one else has any; that an extra man is helping your men give your horse a supergrooming; that your wishes are anticipated; that every man is "Johnny on the spot." And then you have arrived.

Fairness is another element without which leadership can neither be built up nor maintained. There must be, first, that fairness which treats all men justly. I do not say alike, for you cannot treat all men alike—that would be assuming that all men are cut from the same piece, that there is no such thing as individuality or a personal equation.

You cannot treat all men alike; a punishment that would be dismissed by one man with a shrug of the shoulders is mental anguish for another. A company commander who for a given offense has a standard punishment that applies to all is either too indolent or too stupid to study the personality of his men. In his case justice is certainly blind.

Study your men as carefully as a surgeon studies a difficult case. And when you are sure of your diagnosis apply the remedy. And remember that you apply the remedy to effect a cure, not merely to see the victim squirm. It may be necessary to cut deep, but when you are satisfied as to your diagnosis don't be divided from your purpose by any false sympathy for the patient.

Hand in hand with fairness in awarding punishment walks fairness in giving credit. Everybody hates a human hog.

When one of your men has accomplished an especially creditable piece of work see that he gets the proper reward. Turn heaven and earth upside down to get it for him. Don't try to take it away from him and hog it for yourself. You may do this and get away with it, but you have lost the respect and loyalty of your men. Sooner or later your brother officer will hear of it and shun you like a leper. In war there is glory enough for all. Give the man under you his due. The man who always takes and never gives is not a leader. He is a parasite.

There is another kind of fairness—that which will prevent an officer from abusing the privileges of his rank. When you exact respect from soldiers be sure you treat them with equal respect. Build up their manhood and self-respect. Don't try to pull it down.

For an officer to be overbearing and insulting in the treatment of enlisted men is the act of a coward. He ties the man to a tree with the ropes of discipline and then strikes him in the face, knowing full well that the man cannot strike back.

Consideration, courtesy, and respect from officers toward enlisted men are not incompatible with discipline. They are parts of our discipline. Without initiative and decision no man can expect to lead.

In maneuvers you will frequently see, when an emergency arises, certain men calmly give instant orders which later, on analysis, prove to be, if not

exactly the right thing, very nearly the right thing to have done. You will see other men in emergency become badly rattled; their brains refuse to work, or they give a hasty order, revoke it; give another, revoke that; in short, show every indication of being in a blue funk.

Regarding the first man you may say: "That man is a genius. He hasn't had time to reason this thing out. He acts intuitively." Forget it. "Genius is merely the capacity for taking infinite pains." The man who was ready is the man who has prepared himself. He has studied beforehand the possible situation that might arise, he has made tentative plans covering such situations. When he is confronted by the emergency he is ready to meet it.

He must have sufficient mental alertness to appreciate the problem that confronts him and the power of quick reasoning to determine what changes are necessary in his already formulated plan. He must have also the decision to order the execution and stick to his orders.

Any reasonable order in an emergency is better than no order. The situation is there. Meet it. It is better to do something and do the wrong thing than to hesitate, hunt around for the right thing to do and wind up by doing nothing at all. And, having decided on a line of action, stick to it. Don't vacillate. Men have no confidence in an officer who doesn't know his own mind.

Occasionally you will be called upon to meet a situation which no reasonable human being could anticipate. If you have prepared yourself to meet other emergencies which you could anticipate, the mental training you have thereby gained will enable you to act promptly and with calmness.

You must frequently act without orders from higher authority. Time will not permit you to wait for them. Here again enters the importance of studying the work of officers above you. If you have a comprehensive grasp of the entire situation and can form an idea of the general plan of your superiors, that and your previous emergency training will enable you to determine that the responsibility is yours and to issue the necessary orders without delay.

The element of personal dignity is important in military leadership. Be the friend of your men, but do not become their intimate. Your men should stand in awe of you—not fear. If your men presume to become familiar, it is your fault, not theirs. Your actions have encouraged them to do so.

And, above all things, don't cheapen yourself by courting their friendship or currying their favor. They will despise you for it. If you are worthy of their loyalty and respect and devotion, they will surely give all these without asking. If you are not, nothing that you can do will win them.

And then I would mention courage. Moral courage you need as well as physical courage—that kind of moral courage which enables you to adhere with-

MILITARY REVIEW

out faltering to a determined course of action which your judgment has indicated as the one best suited to secure the desired results.

Every time you change your orders without obvious reason you weaken your authority and impair the confidence of your men. Have the moral courage to stand by your order and see it through.

Moral courage further demands that you assume the responsibility for your own acts. If your subordinates have loyally carried out your orders and the movement you directed is a failure, the failure is yours, not theirs. Yours would have been the honor had it been successful. Take the blame if it results in disaster. Don't try to shift it to a subordinate and make him the goat. That is a cowardly act.

Furthermore, you will need moral courage to determine the fate of those under you. You will frequently be called upon for recommendations for the promotion or demotion of officers and noncommissioned officers in your immediate command.

Keep clearly in mind your personal integrity and the duty you owe your country. Do not let yourself be deflected from a strict sense of justice by feeling of personal friendship. If your own brother is your second lieutenant, and you find him unfit to hold his commission, eliminate him. If you don't your lack of moral courage may result in the loss of valuable lives.

If, on the other hand, you are called upon for a recommendation concerning a man whom, for personal reasons you thoroughly dislike, do not fail to do him full justice. Remember that your aim is the general good, not the satisfaction of an individual grudge.

I am taking it for granted that you have physical courage. I need not tell you how necessary that is. Courage is more than bravery. Bravery is fearlessness—the absence of fear. The merest dolt may be brave, because he lacks the mentality to appreciate his danger; he doesn't know enough to be afraid.

Courage, however, is that firmness of spirit, that moral backbone, which, while fully appreciating the danger involved, nevertheless goes on with the undertaking. Bravery is physical; courage is mental and moral. You may be cold all over; your hands may tremble; your legs may quake; your knees be ready to give way—that is fear. If, nevertheless, you go forward; if in spite of this physical defection you continue to lead your men against the enemy, you have courage. The physical manifestations of fear will pass away. You may never experience them but once. They are the "buck fever" of the hunter who tries to shoot his first deer. You must not give way to them.

A number of years ago, while taking a course in demolitions, the class of which I was a member was handling dynamite. The instructor said regarding its manipulation: "I must caution you gentlemen to be careful in the use of these explosives. One man

has but one accident." And so I would caution you. If you give way to the fear that will doubtless beset you in your first action, if you show the white feather, if you let your men go forward while you hunt a shell crater, you will never again have the opportunity of leading those men.

Use judgment in calling on your men for display of physical courage or bravery. Don't ask any man to go where you would not go yourself. If your common sense tells you that the place is too dangerous for you to venture into, then it is too dangerous for him. You know his life is as valuable to him as yours is to you.

Occasionally some of your men must be exposed to danger which you cannot share. A message must be taken across a fire-swept zone. You call for volunteers. If your men know you and know that you are "right" you will never lack volunteers, for they will know your heart is in your work, that you are giving your country the best you have, that you would willingly carry the message yourself if you could. Your example and enthusiasm will have inspired them.

And, lastly, if you aspire to leadership, I would urge you to study men.

Get under their skins and find out what is inside. Some men are quite different from what they appear to be on the surface. Determine the workings of their minds.

Much of General Robert E. Lee's success as a leader may be ascribed to his ability as a psychologist. He knew most of his opponents from West Point days, knew the workings of their minds, and he believed that they would do certain things under certain circumstances. In nearly every case he was able to anticipate their movements and block the execution.

You cannot know your opponent in this war in the same way. But you can know your own men. You can study each to determine wherein lies his strength and his weakness; which man can be relied upon to the last gasp and which cannot.

Know your men; know your business; know yourself.

The foregoing article is a reprint from the *Congressional Record*, 15 June, 1942, of an address delivered in 1918 by Major Christian A. Bach, Cavalry, to student-officers of the Second Training Camp, Fort Sheridan, Illinois. Published in the *Congressional Record* at the instance of Senator Henrik Shipstead of Minnesota, the thoughts expressed are as true today as they were twenty-four years ago.

Colonel Christian A. Bach entered the army at the outbreak of the Spanish-American War as a volunteer in the Thirteenth Minnesota Infantry. In 1901, he was commissioned First Lieutenant of Cavalry in the regular army and served with honor and distinction until he was retired in 1934.

During World War I, Colonel Bach was Chief of Staff of the Fourth Division, A.E.F.

A graduate of the Mounted Service School in 1911, Colonel Bach was also a Distinguished Graduate from the Army School of the Line, Fort Leavenworth, Kansas, in 1916. In 1924 he graduated from the Army War College.

Among the honors which came to this officer while in service were the Silver Star citation, the Distinguished Service Medal, Officer of the Legion of Honor (France), and the Croix de Guerre.

Colonel Bach died 16 April, 1942 at Fort McPherson, Georgia.—THE EDITOR.

Some Thoughts on the Motorized Division

By
LIEUTENANT COLONEL JOHN H. RIEPE, *Cavalry*,
Instructor, Command and General Staff School.

Is the existence of the Motorized Division as a separate and special unit justified? Is it sufficiently superior in combat efficiency to an Infantry Division temporarily motorized by the attachment of additional transportation? The answer to both questions is very definitely "Yes." If only for the fact that its organic transportation makes this large unit almost instantly available for rapid movement to some critical area, then we have sufficient reason for the inclusion in our service of a certain number of Motorized Divisions. Also, all personnel of the Motorized Division are specialists in the efficient use of motor transportation and therefore can squeeze more benefits from its availability than can untrained personnel. These two facts alone should be sufficient *raison d'être*.

Since the creation of our initial Motorized Division continued experimentation has resulted in constant revision. Changes in organization and equipment have been accompanied necessarily by revised tactical doctrine. At one time, with the division mounted in armed and armored track-laying vehicles, the trend in conception of method of employment was towards that of the Armored Division. Today, with its organization very similar to that of a normal Infantry Division, and with its combat elements transported mainly in ordinary cargo trucks, its use *in battle* approaches that of an Infantry Division. Its use *before battle*, however, is entirely different due to its great mobility in rear of the battle position.

The great mobility of the Motorized Division is gained by getting every soldier off his feet and into some sort of motor vehicle. Today the vehicle in greatest use as a personnel carrier is the ordinary 2½-ton, 6 x 6 cargo truck. Its capabilities for rapid movement on good roads, steady movement on poor roads, and its considerable mobility off roads are well known. As a result of the capabilities of its vehicles this division has greater *strategic* mobility than any of our other large ground units. But as a result of the limitations of its vehicles it has only the *tactical* mobility of an Infantry Division. Its unarmed and unarmored vehicles do not permit it to fight from its vehicles as does the Armored Division. When it comes under fire its troops must get out of their vehicles. Under these conditions its mobility is exactly that of an Infantry Division. As a matter of fact under these conditions the Motorized Division becomes an Infantry Division with the latter's ability for sustained offensive or defensive combat. These characteristics make the Motorized Division ex-

tremely useful in operations in conjunction with, or in support of, large armored units. The Motorized Division is weak in the armored units so essential for shock action, and the Armored Division is weak in the infantry units required for holding ground or clearing its way in certain situations. The two types of division can overcome each other's weakness by mutually supplying each other's wants, thus making them ideal team-mates.

The special characteristics of the Motorized Division require that it be used for special purposes and not wasted on missions which can be performed equally well by other units. The missions for which it is especially well suited are as follows:

1. Operations in support of, or in conjunction with, Armored Divisions.
2. The seizing and holding of critical points.
3. Exploiting successes of special troops such as paratroops.
4. Wide envelopments and turning movements
5. Strategic reserve for large units.

Actually the performance of each of these missions involves the application of only one or more of a limited number of basic operations. Among the most common operations in which this division may be involved are those shown in the accompanying diagrams.

Obviously these operations listed above do not exhaust the possible uses for the Motorized Division. It is entirely conceivable that in certain circumstances it would be invaluable in such operations as pursuit, delaying action and defense of a river line, although these actions could be just as well, or better, performed by other units. Just as obviously there are certain operations which do not require, or which cannot utilize, the special characteristics of these units. Such operations as the attack of a fortified locality, combat in woods, mountain operations, combat in snow and extreme cold and jungle operations should not be required of the Motorized Division unless the necessity for its use is very great.

In all of these tactical operations certain problems are created and other problems are solved by the presence of this additional transportation. For example, because of the number of vehicles involved, the selection of detrucking areas in a combat situation must be carefully considered and the detrucking operation itself must be frictionless. This problem can be partially solved by prior training in a limited number of standard detrucking procedures involving platoon, company or battalion areas, de-

pending upon the extent of available cover. This problem solved, another immediately presents itself—the proper disposition of the empty vehicles. Two alternative solutions suggest themselves. If sufficient cover is available at the detrucking site, control of the vehicles may be decentralized to companies and platoons which then disperse and conceal their own vehicles locally. Ordinarily, however, sufficient cover is not available locally in which case the vehicles must be moved to the rear, at least as far as the

nearest adequate cover, under centralized control initially by combat team and eventually by division. One eternal problem, that of maintaining the division reserve mobile, solves itself in the Motorized Division. The division reserve is automatically motorized and further, by means of its organic vehicles and various means of communication, it can protect itself by physical dispersion of its component units while still remaining tactically concentrated.

A final interesting possibility is submitted for

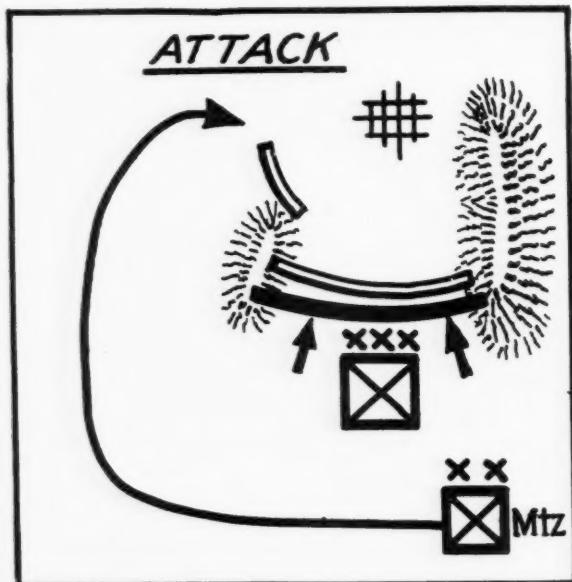


FIGURE 1
USE OF THE MOTORIZED DIVISION IN A WIDE TURNING
MOVEMENT.

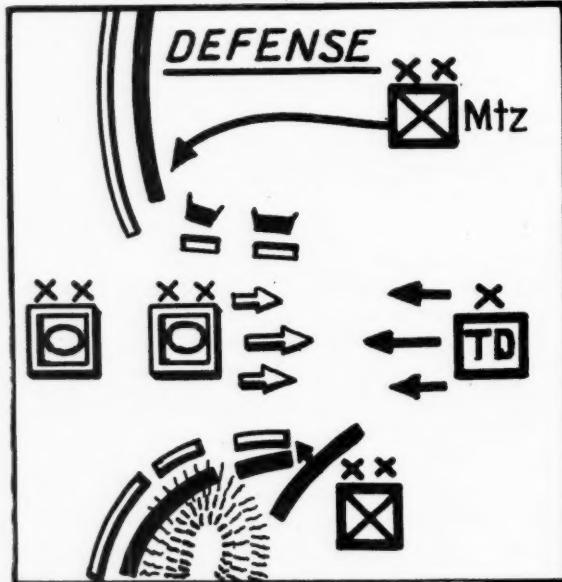


FIGURE 2
USE OF THE MOTORIZED DIVISION TO HOLD THE SHOULDER
OF A HOSTILE PENETRATION.

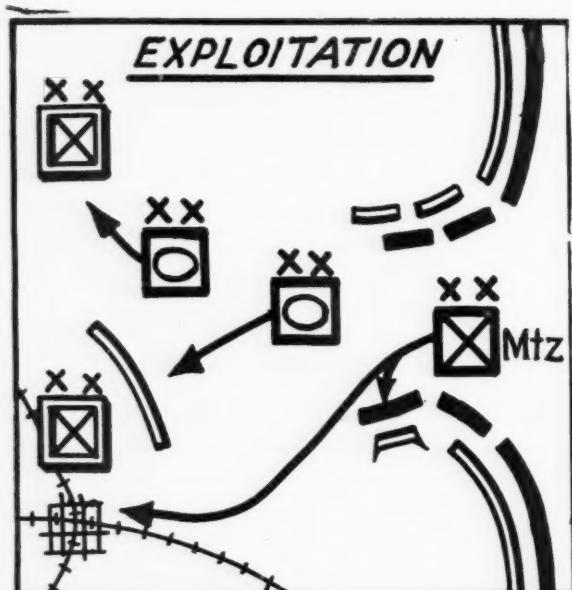


FIGURE 3
USE OF THE MOTORIZED DIVISION IN REINFORCING THE TROOPS
HAVING MADE THE BREAK-THROUGH AND FOR MOP-
PING UP OF THE HOSTILE VILLAGE.

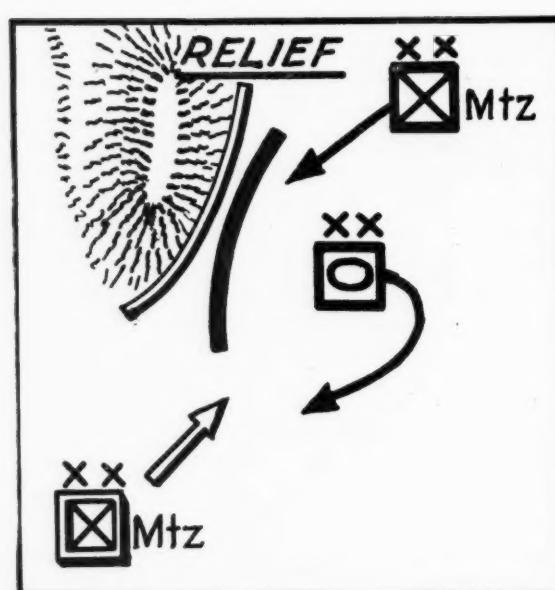


FIGURE 4
USE OF THE MOTORIZED DIVISION IN RELIEF OF AN ARMED
DIVISION SO THAT THE LATTER CAN BE
PUT TO MORE ADVANTAGEOUS USE AGAINST
A HOSTILE MOTORIZED DIVISION.

consideration. We are all familiar with the normal practice of shuttling an Infantry Division. With the enormous number of vehicles released by the commitment of a Motorized Division into a battle area, why

couldn't these vehicles be employed to move one or more Infantry Divisions in one haul into some profitable area for their use—shuttling on a Corps or even an Army scale?

The Future of Night Attack

By
COLONEL H. E. KELLY, *Infantry*,
Instructor, Command and General Staff School.

Large scale night attack had been considered impracticable by nearly all the military powers until this war. Our Field Service Regulations seem to mirror the general opinion when they state after outlining numerous problems connected therewith:

"The difficulties of night attacks increase with the size of the command. They therefore usually are undertaken only on a limited scale and with limited objective."

More than ten years ago the Japanese began to challenge this premise. Admitting the difficulty inherent in the operation, they still estimated that practical familiarity with night operations would, relatively at least, convert these same difficulties to advantages. As we now know this is precisely the approach which Japan later took to jungle warfare with the startling results that are now history.

On the other hand the comfort loving, softer living democracies have been well content to accept without challenge the premise that large scale night attack was too difficult to control, hence impracticable and dangerous to attempt. Electric power, steam heat, automobile transportation and all the other adjuncts of modern civilization leave little taste for night maneuvers.

It is doubtless true that night operations attempted by troops untrained for the task may well end in disaster. But can we afford to say that experts will not succeed?

The time is at hand when we must become familiar with night operations on a large scale or accept the chance of a very unpleasant surprise.

We are confident of our ability to out-produce our foes in armor, planes and artillery. Once we have done this we will be in the position of the long armed fighter who far outreaches his husky but shorter adversary. We could then use these weapons to jab him into submission, or at least so we hope. But suppose the Jap covers up as he has planned under cover of darkness and bores in close to exploit his manpower and discount our firepower? Our superior matériel is worth little by night against such attacks. Our men must have practical training

to use as well as to meet this type of attack, already used at Hong Kong, Singapore, Corregidor and other places.

Fortunately our remaining enemies, the German and the Italian, are traditionally unsuited for night fighting and seem to dislike it greatly. Every school boy remembers Washington's easy victory over the Hessians at Trenton and both Russians and British have recently used night attack to an increasing extent and appear enthused by the results. In Libya, moonlight attacks against Belhamed, Sidi Razegh and El Duda were all successful with small loss against superior forces. A British source states: "Where no wire entanglements exist any position can be taken by a determined bayonet attack under cover of darkness." The South Africans in particular have developed the technique of night attack in the desert and use it by choice whenever possible.

With this brief background let us abandon generalities and consider specifically the difficulties we must confront, how they can be overcome and the resultant advantages of night attack.

Let us consider the advantages of night attack. They are many, but roughly may be summarized as follows:

1. The efficiency of tanks, artillery and machine guns, in fact of all firepower, is greatly reduced at night when aimed fire is impracticable.

2. Surprise is easier to obtain because of limited visibility. Furthermore, its effect is enhanced since troops surprised at night panic readily.

3. Methods of combat developed for use by day are unsuitable at night. Thus a highly trained mechanized force, formidable by day, may readily be placed at great disadvantage if attacked at night under conditions with which they are not familiar.

Now let us consider the disadvantages which have long been considered insurmountable:

1. Lessened visibility complicates control and movement. Hence, leadership becomes a problem, direction and formation are difficult to maintain and the difficulty of recognizing friendly troops makes the danger of firing into them serious.

2. It is difficult to support a night attack by fire since aimed fire is impracticable and the attacker is more exposed to unaimed fire than is the defender.

3. Morale is sensitive. Troops who lack confidence and aggressiveness are particularly prone to panic during night attack.

If we are to exploit the advantages of night attack we must be ready to minimize its disadvantages skillfully. What will this involve?

We may sum up our answer by saying the solution is one of *perspiration* rather than of *inspiration*. There is no substitute for practical work. Results may, however, be speeded up by skillful direction of troop effort. Proper individual training will take care of the most of our difficulties.

Basic training can be grouped under three headings—physical training for hand to hand combat—scouting and patrolling and the use of night combat weapons such as bayonet, grenade, knife, pistol, riot and tommy guns. Of course development of the senses of sight, smell and hearing is also vital. Last comes our small unit training. Our units must be able to maintain direction and formation under the most adverse conditions. Practical work should start over familiar and progress over increasingly difficult and unfamiliar terrain. The basis of movement should be the *column of file* maintained till the last minute coupled with ability to shift rapidly to either line or wedge with limit of visibility intervals. It should be constantly borne in mind that every element of a formation must be within sight of a base or guide throughout. Where increased interval or distance is required connecting files must be used. On very dark nights movement is sometimes facilitated by linking men together with their tent ropes. However, it is surprising how rapidly the senses develop under night conditions. Recall the last war, city boys learned to drive trucks or move through thick forest by night without lights and as a matter of course and in a matter of weeks. With proper fundamentals and small unit training mastered, we must now consider how to apply this training to best advantage tactically.

Before we consider the problem of night attack let us first consider the simpler one of night defense, which is important not only from the angle of our own employment but also from the viewpoint of how a strong defense must be overcome if an attack is to succeed.

The basis of night defense is the use of obstacles mined, trapped and cleverly protected by planned fires of artillery and infantry weapons. Our training must stress the early protection of a newly won position with obstacles and fire since a counterattack launched against such a position under cover of darkness has the great advantage of better familiarity with the terrain than has the newly arrived occupant of the position. If the position is not rapidly protected by obstacles held under enfilade fire of

heavy weapons, disorganized troops will have little chance against a skillfully launched night counter-attack. Machine guns form the skeleton of this defense but it should be borne in mind that shoulder weapons can be re-laid on a prearranged barrel elevation by improvised means with fair accuracy. For example a strip of ground such as an edge of woods, stream bank or other level or uniformly sloping ground or other places where one barrel elevation would be effective can be re-covered by marking the elbow positions and barrel elevation when the weapon is laid by direct means. Small stakes can be used to mark the elbow positions and ramrod or string, the barrel elevation. Accuracy obtainable can be checked on the 1,000 inch range and should be found to be within usable limits. It should be borne in mind that every shoulder weapon not thus used becomes practically worthless once visibility is lost. To protect them from destruction, heavy weapons sited for flanking fire should be sited in defilade or at least screened to the front to increase the difficulty of locating them through muzzle blast.

Small units should be trained to stand to arms against sudden night attacks employing simple pre-arranged plans. If this can be included in early basic training, men improve rapidly in their ability to "hit the deck" ready for action.

Lastly let us consider the problem of night attack itself. Several types may be used. Regulations stress the use of the local attack accurately limited by a definite "box" formed by recognizable boundaries, line of departure and objective. This control is, of course, essential. It will be frequently possible to close with a strongly held position by tying a number of such "boxes of attack" together so as to cover a wide front. Such an attack, prepared and supported as a series of decentralized local attacks, should, even with partial success, furnish toe-holds for later exploitation. Every effort should be made in advance by feints and patrols to locate artillery concentration areas and particularly machine-gun positions so as to neutralize them. Objectives illuminated by fire, smoke or parachute flares may assist maintenance of direction. If the attack is to be pushed to any depth successive echelons should pass through each other in accordance with carefully pre-arranged plans. Small arms fire should not be used except with short range weapons such as riot guns or carbines. Identification should be clearly indicated by unmistakable markings and recognition signals. This is a vital essential.

Infiltration tactics as used by the Japanese so as to work small groups to the rear of strong defense areas in order to coordinate later effort with a daylight frontal attack, would not be effective if these strong blocking positions were supported by aggressive reserves echeloned in depth and with mobility equal to the attacker's.

Other possibilities such as night attacks on nar-

AN ENEMY STRONG POINT IN THE LIBYAN DESERT

row fronts along roads with a view to pushing deep by night and widening the salient thus created by day may be worth considering. The 9th Infantry made such an attack in the closing days of the last war. Another interesting recent development has been the Russian use of cavalry night attack to exploit its mobility while offsetting the vulnerability of cavalry to daylight air attack.

Whether or not we plan to adopt night attack on

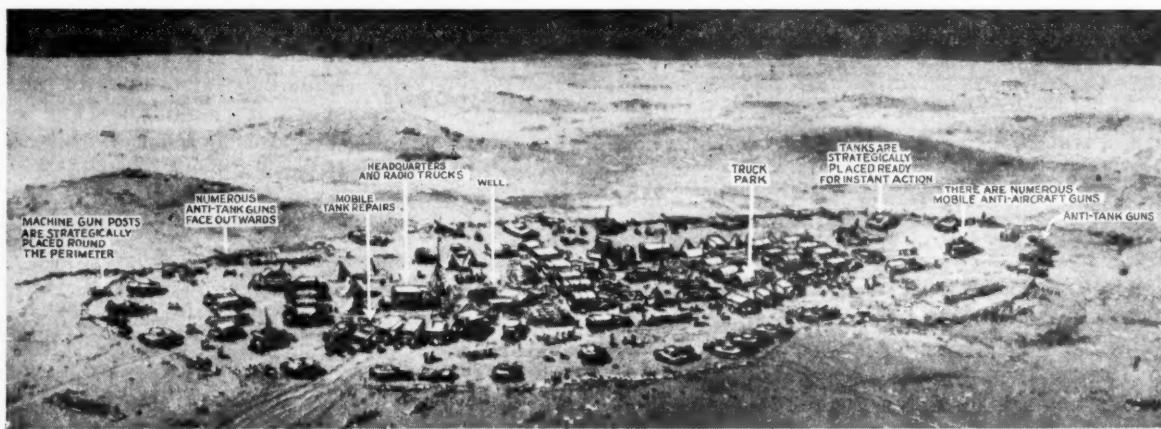
a large scale we must certainly prepare to meet such attacks. The only answer to the difficulties of night operation is practical experience. Fortunately training in night operations provides good all purpose training, since it develops confident aggressive men capable of doing their part in any operations of any type. Such time is certainly well spent. But remember, it's a case of *technique* not *theory*—perspiration not inspiration.

An Enemy Strong Point in the Libyan Desert

From the *Illustrated London News* 6 June 1942

The official dispatches from the Middle East frequently state that "Our patrols were active," but lacking familiarity with modern desert fighting there are not many who realize just how mobile units, consisting of armored vehicles, armed trucks, and so forth, rove about the desert, spying out the movements of the enemy and frequently becoming involved in sharp encounters. Both sides have established strategic strongpoints, usually in the vicinity of the wells dotted about the arid waste. The illustration shows a Nazi strong point in the desert as it might appear to an observer some distance away. Patrols constantly penetrate ten or more miles inside enemy territory and, approaching the enemy's posi-

tion in the dim light of early dawn, find some suitable depression, and there wait and watch—sometimes not more than one and a half miles from the enemy encampment. No radio communication is possible between these watchers and their base, because the enemy would pick up the signals and thus be instantly warned of their presence; so messages are only sent when some important movement is afoot, at which time the moment has probably arrived for the patrol to make a "getaway." It is such a patrol which probably reported the opening moves in the attack launched in Libya by General Rommel not long ago. Only a ceaseless vigil over many months could insure the Eighth Army against surprise attack.



Illustrated London News

Observations During the Campaign on Luzon

BY
A UNITED STATES MILITARY OBSERVER.

Prisoners of war are sent to the rear by the Japanese as quickly as possible. Unwounded prisoners are marched for distances as long as from ten to fifteen miles. Prisoners are given a very cursory examination by the S-2 of the unit which takes them, and then they are immediately dispatched to the rear. Specially qualified officers are assigned to permanent duty at all division headquarters in the field for the purpose of examining prisoners of war. These officers speak the prisoners' language and are exceptionally efficient in securing information from prisoners, particularly enlisted prisoners. The examination of individual prisoners by these officers is thorough in detail, and individual prisoners are questioned for as long as two hours.

Combat troops are not burdened with the guarding of prisoners. During examination, prisoners are given no food or water and allowed no rest. This does not apply to wounded prisoners, who are submitted to the same type of thorough examination after their wounds have been dressed.

Japanese transport is meager, and prisoners are marched great distances day after day, and seldom transported by vehicles. Motorized and armored troops immediately turn over all prisoners taken by them to the nearest infantry units. There is evidence that Japanese motorized and armored troops are liable to kill, instead of capture, small enemy groups which fall into their hands.

Straggling is a military crime in the Japanese Army. Captured Japanese testified, in Malaya and Luzon, that stragglers, who were not sick or disabled, were sometimes shot. This refers to stragglers in combat.

There is very little straggling on the march in the Japanese Army, as it is considered a disgrace for a soldier to straggle, and there have been instances where exhausted men have destroyed themselves rather than be picked up as stragglers.

Interference with military operations by civilians, either in friendly or hostile country, is severely dealt with by the Japanese Army. Two Filipino truck drivers involved in a collision at a crossroads at San Fernando were shot by a Japanese officer because their damaged vehicles obstructed the road and delayed the passage of a tank platoon.

Civilians found in the vicinity of Japanese transport parks, headquarters, munitions dumps, military telephone lines, unless they have a specific authorization, are shot without examination or trial. Malayan and Filipino civilians found walking, cycling, or motoring on roads which had been ordered cleared

for the passage of Japanese troops or transportation were summarily shot. It is reported that groups of civilians as large as a hundred or more were thus dealt with.

It is the Japanese attitude that the civilian exposes himself to these extreme penalties by merely circulating in the combat zone.

After the capture of large cities in British Malaya and Luzon the Japanese military authorities instructed the civilian law enforcement agencies to continue to function.

In Manila the Japanese military authorities informed the civilian law enforcement agencies that they would hold the latter responsible for attacks on Japanese parachutists or other troops.

They also instructed the civilian law enforcement agencies that they would hold them accountable if bolos, pistols, or other weapons were found in the hands or homes of civilians. It may be presumed that the immediate heads of the civilian law enforcement agencies would be shot if any weapons were found in the possession of civilians after these instructions had been issued.

The heads of all civilian law enforcement agencies were instructed to report daily to the commanding officer of the military police for instructions.

All Japanese unit commanders make daily reports to division commanders of all incidents indicating the slightest deterioration in morale. If a commander fails to make report of any such incident, however trivial, explanation is required by higher authority. If the incident is a serious one, and is not reported, the unit commander is relieved.

Platoon and company officers are held strictly accountable for the morale of their units, and it is common for them to interview and examine every man in their unit in the evening, such examination including inspection of the individual soldier's feet, state of his clothing, and brief discussion of his family affairs. There is no mawkishness in this individual examination, which is known to be a duty of the officer, and the soldier apparently welcomes it as evidence of the emperor's solicitude for his own and his family's welfare.

The platoon, company, battalion, and regimental commanders are charged with many of the duties and responsibilities which we delegate to chaplains, surgeons, and welfare agents. In other words, there is a paternalism within the unit that includes the reposing of intimate personal confidence in the unit commander by the individual enlisted man.

The officer constantly impresses upon the soldier

OBSERVATION AVIATION

that they are all servants of the emperor, and that his only distinction lies in the fact that he is the instrument to convey the emperor's orders.

The Japanese Army is very strict in its insistence on the cleanliness of eating utensils. On the other hand, it is surprisingly lax in other aspects of sanitation.

Troops destined for tropical combat are carefully acclimated in tropical regions before being sent to the theater of operations. This acclimatization process is continued for as long as six months in some instances.

The Japanese Army immunizes all civilians against certain diseases in occupied areas. In China, in some instances, those who did not report for such immunization were shot.

In Luzon it was the custom of the Japanese Army to withdraw whole divisions from the front

and replace them with full-strength divisions. This was probably done to give new divisions combat training. Divisions were withdrawn regiment by regiment and replaced regiment by regiment, an unusual technique.

All Japanese dead were incinerated, not buried, and small packages of ashes were labeled and returned to Japan. There were no graves registration or burials.

Japanese troops withdrawn from the front lines are given, if possible, at least two weeks of rest before they return to the lines. While in rest areas they receive one hour of bayonet training per day, but no other training. Japanese troops are habitually given two weeks furlough and transportation to Japan when they have distinguished themselves in combat.

Observation Aviation

By

LIEUTENANT COLONEL RAY W. CLIFTON, *Army Air Forces*,
Instructor, Command and General Staff School.

Observation aviation is that class of aviation which has the primary function of obtaining information.

Observation aviation does not replace any of the other intelligence agencies, but supplements them and does provide the ground commander with the means to secure information which cannot be secured by any other means.

Observation is assigned to a ground-air support command. The ground-air support commander retains centralized control of the observation aviation so assigned and he places this aviation in support of the ground units in the amount needed.

The ground-air support commander is charged with the responsibility for the maximum support of the plan of the supported ground commander. In order to accomplish this efficiently, he must have sufficient control to dispose his units in conformity with the requirements established by the ground commander. He and his group commanders lay general plans for the complete coverage of all areas affected to eliminate overlapping and unnecessary missions in lower echelons. Actual operations will be decentralized to permit ground unit commanders to make direct requests upon supporting observation units for missions and receive the resulting intelligence information direct. A division may be supported by a squadron or it may have reserved for it a definite number of missions from a squadron.

When divisions are operating on a normal corps front, it can be expected that the corps will control the reconnaissance missions conducted by observation and will obtain all information needed by the divisions. In case a division is operating independently or is operating quite a distance from the normal corps front, then the division commander will probably be authorized to call directly upon an observation squadron for observation missions.

The normal basis for the allotment of observation aviation is as indicated below; however, the actual amount available to each ground unit will depend upon the total observation aviation assigned to the ground-air support command and upon its distribution as dictated by the situation.

a. *Theater headquarters.*

One or more mapping squadrons.

b. *Each army.*

One observation group, consisting of two observation squadrons and a photo squadron.

c. *Each army, armored, and cavalry corps.*

One observation group consisting of one observation squadron for corps and one observation squadron for each division.

d. *Force Headquarters, Armored Force.*

One photo squadron.

MILITARY REVIEW

Based on present information, the squadrons have the following type airplanes:

a. Observation squadron.

Fighter.

Light Bombardment.

Liaison.

b. Photo squadron (Reconnaissance).

Photographic, 2-engine, Fighter.

c. Photo squadron (Mapping).

Photographic, 2-engine, Medium Bombardment.

The types of missions which will be flown by observation aviation are:

a. Reconnaissance Missions.—These are conducted for the purpose of gaining information of the hostile forces, gaining information of the terrain, obtaining vertical or oblique photographs of small areas or sensitive points, and searching for suitable targets for combat aviation.

(1) *Missions for infantry.*—Missions performed for Infantry include the location of the opposing front lines, observation of the progress of combat, location of hostile resistance or enemy penetrations into our positions, and assembly of hostile troops for attack or counterattack. Before directing observation aviation to perform missions of this type, commanders should take into consideration the high casualty rate to be expected, and should balance this factor against the value of the information desired. Frequently a single sortie may be able to determine the desired information, in which case the mission should not be burdened with requests for additional reconnaissance. Also, it must be remembered that observers flying in speedy airplanes will not be able to find small bodies of hostile resistance, especially in wooded terrain.

(2) *Cooperation with cavalry.* — Observation aviation does not replace or supplant Cavalry as a reconnaissance agency, but by proper cooperation increases the effectiveness of that arm by extending its radius of action and by directing attention to known or suspected hostile forces, thereby obviating useless marching and conserving men, horses and matériel. Observation for Cavalry is particularly important in the initial phases of a strategic or tactical movement. During combat the observation aviation mission with Cavalry is essentially the same as that with Infantry.

(3) *Cooperation with armored and motorized forces.*—The rapid movement of armored and motorized units calls for the use of observation aviation for distant and route reconnaissance, march liaison, observation for artillery and normal liaison. Observation aviation is of vital importance in the operation of armored forces.

b. Artillery Missions.—These are conducted for the purpose of adjusting artillery fire and locating targets for the artillery. The liaison type airplanes may operate over friendly territory for the adjustment of artillery fire; however, due to extreme vulnerability, even to ground fire near the front lines, this type airplane must be looked upon more as an elevated observation post rather than an observation airplane for the adjustment of artillery fire. Enemy air activity will more readily curtail the use of this type airplane than the high performance observation type. With the realization of these factors, observation and artillery units must depend upon the normal high performance observation airplane to some degree for adjustment of fire as long-range artillery fire, defilade and poor visibility may require that such adjustment be carried out over hostile territory. Proper planning and prearrangement must be thoroughly considered for rapidity of adjustment to reduce to a minimum the time which the airplane spends over hostile territory.

c. Liaison Missions.—These are conducted for the purpose of gaining information of friendly forces, effecting liaison between friendly units, quickly transporting military personnel and transmitting orders and important messages between appropriate command posts. Where the situation permits, this mission may be performed by the liaison type airplane. However, all concerned must realize that this type airplane is extremely vulnerable to hostile ground and air fire, that normally it must be employed only over friendly territory, and that conditions of modern warfare may not provide a definite line of demarcation between hostile and friendly territory, behind which such airplanes can operate.

The effectiveness of observation aviation depends upon several factors, some of which shall be discussed.

CHARACTER OF HOSTILE FIGHTER AVIATION.

If we could have the privilege to enjoy complete control of the air as the Germans did a few days after they had entered Poland, we would be able to employ our observation aviation without any difficulty in most any manner. However, it must be realized by all concerned that when operating against an enemy of approximately equal air strength, complete control of the air will seldom, if ever, exist. Therefore, it is probable that observation aviation may have to conduct brief sorties to obtain information: that is, a reconnaissance mission may have to be flown at minimum altitude and maximum speed to a point for the purpose of obtaining some definite information and returning without delay.

Again it may be necessary to restrict reconnaissance missions to definite periods when fighter protection can be provided.

Let us stress that with the possibility of always having hostile fighter interference, we can expect heavy losses of observation aircraft and that observation aviation should be sent *only when the information required is essential to the success of the ground arm.*

OBSERVATION AVIATION

EFFECTIVENESS OF HOSTILE GROUND FIRE.

The higher an observation airplane has to fly the less detailed information the observer is going to be able to obtain. Effective .50 caliber MG fire will tend to keep the airplane above 2,700 feet. Effective 37-mm gunfire will tend to keep the airplane above 7,500 feet. Effective three-inch gun activity will tend to keep the airplane above 17,500 feet. Effective 90-mm gunfire will tend to keep the airplane above 24,000 feet. Ground troops in forward combat areas will normally be using only the .50 caliber MG and the 37-mm gun. Therefore, as far as hostile ground fire from those troops is concerned a reconnaissance mission can be flown at about 8,000 feet. This is quite a favorable altitude as one can obtain information fairly well in detail on all objects not concealed. However, it would be very difficult obtaining information on a well fortified area in which 3-inch and 90-mm gunfire is being used.

PERFORMANCE CHARACTERISTICS OF THE EQUIPMENT EMPLOYED AND THE DEGREE OF TRAINING OF THE PERSONNEL.

It is obvious that the higher the performance one can get out of an airplane, the more chances he has for a successful reconnaissance mission. But without trained personnel an airplane with high performance is useless. Personnel must be trained to work with the ground troops and the best solution one must strive to reach is to keep the ground and air units together which have trained together.

WEATHER.

When there is fog the observer will see very little, perhaps nothing and he will not have much success in low clouds, rain or snow.

TYPE OF TERRAIN.

An observer flying over heavily wooded terrain will not see nearly as much as when flying over open terrain. However, an observer flying over heavily wooded terrain at tree top elevation would have more of a chance to reach a definite point and obtain some definite information than one flying over open terrain because the airplane probably never would be in an open space long enough at any one time for a man on the ground to get in an effective shot. An observer flying low over open terrain would have his airplane vulnerable to ground fire at all times when near ground weapons. When flying over open terrain, the observer would have to fly at an altitude out of range of ground weapons; then he would become more vulnerable to hostile fighter aviation.

PASSIVE MEASURES OF COUNTERINTELLIGENCE OF THE ENEMY.

If the enemy keeps himself well concealed and makes good use of camouflage, the aerial observers are going to have a difficult time obtaining information.

However, during the winter when the leaves are off the trees, it is very difficult and impossible in many cases for troops to conceal themselves sufficiently to prevent an aerial observer seeing them.

TIME OF DAY MISSION IS FLOWN.

It is obvious that more can be seen in daylight than during darkness. What can be seen in the daylight depends upon several factors such as weather, type of terrain being observed, speed of aircraft, type of enemy interference, and many others. In general the following can be seen from various altitudes in the daylight when operating under *ideal* conditions:

First—500 feet.—One can identify friendly and enemy troops by their uniform and equipment.

Second—1,000 feet.—One can determine whether trenches, fox holes, or shell holes are occupied.

Third—1,500 feet.—One can follow the progress of an infantry attack.

Fourth—2,500 to 5,000 feet.—One can see small bodies of troops not concealed in trenches or fox holes. The location of a command post can be determined from this altitude, if, for example, there is a column of dust leading to it. It is impossible to keep dust from rising from a dirt road or trail during a dry period. It is obvious that the command post can never be established at the end of a dirt trail during dry weather. If it is, the air observation will surely find it.

Fifth—8,000 feet.—One can count railroad cars in siding, see piles of ammunition if not camouflaged, see men walking on open terrain, in fact, obtain information fairly well in detail on all objectives not concealed.

Sixth—10,000 to 20,000 feet.—One can see a large concentration of troops consisting of a minimum of 200 men, motor convoys, railway trains, and a marching column of troops.

Seventh—25,000 feet.—One can see trains, columns of troops one mile long, and large bodies of troops. Destroyed bridges will be readily seen.

Night visual reconnaissance is very difficult. General visual reconnaissance on moonless nights is impracticable without flares. One can get quite detailed information on full moonlight nights up to an elevation of 2,000 feet. But ground fire then becomes effective.

What can be seen at night without flares is a question asked many times. Let us consider a dark clear night with half moon. Troops moving on light colored roads will be visible in form of dark irregular masses. Truck columns can be seen if there are any lights on the columns. In one instance, an observer picked up a truck column which was traveling at night without headlights. The reason he was able to find it was the fact that the trucks were traveling over hilly terrain, the drivers were using the brakes,

and the stop lights had not been disconnected. Commanders of truck columns cannot be too careful about their lights. Bivouacs can be seen by their lights and fires, guns when firing, and certain features on the face of the earth, such as rivers.

Flares are good for observing details of small areas.

The primary function of a photo squadron is to accomplish all aerial photography required by the army or armored force to which assigned, except the reconnaissance photography performed by observation squadrons. They will be able to perform a limited amount of mapping, but such functions are not normal and will seriously curtail their normal useful functions.

Mapping squadrons are constituted for the use of the theater headquarters to perform mapping in any area which is likely to become of military interest. The services of mapping squadrons will not generally be required by or available to lower echelons as that work will have been previously accomplished. It should be normal to have a mapping squadron assigned to each oversea theater.

The discussion in the article will be confined to the reconnaissance photography performed by the observation squadrons. Performing aerial photography during periods when there is friendly control of the air presents no particular problem other than that presented by the weather. However, it must be constantly borne in mind by supported units that, in the face of active enemy aerial opposition, it is suicidal to attempt to photograph a specific objective at regular intervals. Photographic aviation will depend upon speed, altitude, and the elements of surprise in order to secure desired photography in the face of strong opposition. At the altitudes at which missions must be conducted in the face of active opposition, the photographic pilot cannot observe troops or installations upon the ground and then secure photographs. Instead, photography must be obtained on a specific strip of terrain without regard to the pilot's ability to see enemy installations, troops, etc. Photography secured in this fashion is capable of giving negative information as well as positive. While it is possible for a clever and ingenious enemy to camouflage and conceal his actions from visual observation, the camera cannot be fooled, particularly when a resultant photograph is studied by highly trained photographic interpreters. Many times, more information can be obtained from an aerial photograph than can be seen with the naked eye. Photographs assist the commander in preparation for and execution of missions. Whenever forces are in contact, aerial photographs are desirable to show location of artillery, concentration of reserves, command posts and fortifications. Aerial photographs taken periodically will show changes in the location of enemy troops and installations.

Before going any further in the discussion of

aerial photographs, it might be well to give a definition of a pin point, reconnaissance strip and mosaic.

Pin point.—Pin point is the taking of two or more photographs of a small area or point. The photographs are usually studied through a stereoscope.

Reconnaissance strip.—A reconnaissance strip is a series of overlapping vertical photographs made from an airplane flying a selected course.

Mosaic.—A picture that is formed by joining together of several overlapping photographs taken at different camera positions. When the photographs are not assembled and are used for intelligence purpose only, it is normal to refer to them as reconnaissance strips.

One good use for aerial photography would be the taking of a reconnaissance strip of a river prior to a river crossing. This strip would show the river banks to a depth of 1,000 yards. Sandbars and underwater obstruction would be indicated unless water is very muddy. Bridges, ferry ships, rough water and fordable positions would be seen. The nature of the banks would be determined. Considering all this, it would seem that no commander should attempt a river crossing without first studying a reconnaissance strip of the river.

What can be seen in a photograph taken at various altitudes depends upon the nature of the terrain, the effectiveness of the camouflage, visibility, time of the year and many other factors. In general, the following can be seen in a photograph taken under ideal conditions at:

- a. 10,000 feet—
 - (1) Location of artillery.
 - (2) Concentration of troops, 100 men.
 - (3) Columns, either foot or truck or train.
 - (4) Defensive works.
 - (5) Terrain characteristics.
 - (6) One car on road.
 - (7) Trails.
 - (8) Man's tracks in snow.
- b. 20,000 feet—
 - (1) About same, except slightly less detail.
- c. 30,000 feet—
 - (1) Large concentrations of troops.
 - (2) Long columns of troops—truck or train.
 - (3) Terrain characteristics.
 - (4) Destroyed bridges.

Photograph delivery time will depend upon the distance the airdrome is from the command post, the kind of weather, and the amount of equipment available; however, the following is about the length of time which will be required to deliver the prints after the request has been received by the air unit:

- a. Six copies of verticals or obliques in one to three hours.
- b. Single reconnaissance strips 25-30 miles long in six to eight hours.

OBSERVATION AVIATION

c. Mosaic of an area 20 x 40 miles or 800 square miles, roughly laid, in 24 hours; and, if perfectly laid, three to four days.

Due to the fact that verticals will probably have to be taken from at least 20,000 feet due to enemy activities, it is advisable to call for obliques in many situations instead of verticals because obliques are easier to obtain, can be obtained in far more adverse weather than verticals, and are good to show the following:

- a. Installations and activities whenever ground forces are in contact.
- b. Suspected locations of artillery, reserves, command posts, and other enemy installations.
- c. Terrain features.
- d. Details of construction of bridges.
- e. Location of front lines.
- f. Camouflage installations.
- g. When there is a stabilized situation oblique photographs can be taken from over friendly territory toward the front and they will show the relative position of the two fronts.

Aerial photographs can be taken at night. However, at the present time only about one-fourth of the area can be covered in one photograph at night that can be covered in daylight. Extensive research is being made and the time is near when nearly as much area will be covered in a single photograph at night as in daylight. It does not matter how good night photography becomes or how much area can be covered in a single photograph, there is still the human element involved for which no remedy has been found. The pilot has to find the place to photograph and that is always going to remain difficult.

Color aerial photography is still in the realm of experimentation, but will probably become common sometime in the near future. There were, formerly, two problems in camouflaging, namely, texture and shadows. Color is a new problem which has been added due to the potent possibilities of color photography in that it will pick up color differences in camouflage that the naked eye cannot detect. There are still undesirable factors which prevent common use of color photography. They are as follows:

- a. Takes much better light for exposure than black and white.
- b. Takes longer to develop prints.
- c. Takes specially trained personnel to develop color photographs with existing equipment.

There are a variety of methods of communication available to the observation team and ground units with which it is operating. Radio, while it is the most widely used, cannot always be considered reliable and must be supplemented by other means.

a. *Radio*.—Radio is the normal means of communication for observation missions with artillery, armored forces, and combat support aviation and is

relied upon generally in operations with other forces, particularly in higher echelons.

b. *Dropped Messages*.—The dropped message is an important and reliable means of communication which is particularly useful to deliver marked maps, photographs, or sketches, none of which can be transmitted by radio.

c. *Panels*.—Simple prearranged codes may at times permit the use of panels as a valuable means of communication when others would not be practicable. They may be of particular value in special operations such as those undertaken by parachute troops or detached raiding parties.

d. *Pyrotechnics*.—These may sometimes be used for communication or identification.

e. *Airplane maneuver signals*.—Simple signals may sometimes be transmitted by maneuvering the airplane in accordance with a prearranged code.

f. *Pick-up messages*.—Messages may be picked up by liaison type airplane, but such is not generally practicable with high performance type aircraft.

g. *Miscellaneous*.—Frequently the most satisfactory and rapid procedure for reconnaissance missions will be to require that the observation team land at the end of a sortie to deliver photos for processing and to be interrogated by intelligence officers.

The ground-air support commander has to designate air boundaries. An air boundary is not just a line drawn on a map. It is a line drawn on the map which follows prominent features on the face of the earth and it designates zones of responsibility for air reconnaissance or air areas. In selecting the army boundary, one must determine how far in front of the Corps is the corps commander directly concerned. From that point, the army commander will conduct reconnaissance. The air boundary between corps or smaller ground units may be the ground unit boundaries providing they follow prominent features on the face of the earth. It is quite obvious that it is necessary for air boundaries to follow prominent features on the face of the earth to enable the aerial observers to see the boundaries.

The observation aviation commander or his representative will be located at the headquarters of the supported ground unit for the purpose of advising the ground unit as to the capabilities and limitations of the air unit and for the purpose of controlling the operations of the air unit. It is advisable that all missions to the air unit be sent through the air representative rather than direct to the air unit. This procedure will give smoother and more efficient air operations.

Let it be stressed that the personnel in observation aviation will always do their best to give the ground units the most effective support physically possible and the best way to get that effective support is to tell the observation aviation what you want, when you want it and not how to do the job. Let them worry about that and you will get results.

Reference: FM 31-35, WD Eng Cir No. 36, 1942.

“We Will Do Anything to Win the War”

—Amos Alonzo Stagg

BY

LIEUTENANT COLONEL WILLIAM F. BRITTON, *Infantry*,
Instructor, Command and General Staff School.

World War I was a platoon leader's war. The present struggle, though far surpassing it in area and numbers involved, is primarily a war of the individual soldier. More than ever his training is vital. An important item of this training is his ability in and his will for hand-to-hand fighting. Much has been written on this subject. It is not the purpose of this article to go into methods in great detail, but to cover the broader aspects of requirements and training. For the purpose of discussion, let us define hand-to-hand fighting as combat aside from the fire fight.

Personal combat—the will to engage the enemy hand-to-hand—cannot be overstressed. It may be involved in any engagement from the full scale battle employing large masses of troops down to the clash of the smallest combat patrols. It may involve street fighting or tank stalking. It may not be necessary in all cases to physically eject the enemy from his position by the use of the bayonet or other close-in weapons, but troops must be so trained as to be willing and eager to do so. Initially, this indicates a program of hardening and toughening the individual.

The German Army has laid great emphasis on training designed to harden its troops physically and mentally. Possibly the belief that this had been very thoroughly accomplished was one reason for their early failure to provide warm clothing for the troops in Russia last winter. If so, we have another case of history repeating itself. The American Indians prided themselves on their ability to endure hardship. They were beaten by a succession of campaigns conducted in mid-winter, under climatic conditions which they proved unable to withstand.

The Japanese have gone in very thoroughly for toughening their men. Undoubtedly the mental process was comparatively easy, taking into consideration the Asiatic temperament. At all events, their Army has laid great emphasis on both physical and mental hardening. For example, they are reported to have intensified their training during very hot weather, to accustom the personnel to severe exertions in great heat. The conduct of their campaigns in Malaya and Burma, especially the success of their tactics of battlefield infiltration, proves the excellence of their training along these lines. Individuals and small groups operated for days on their own, working to the rear of the British positions, taking the severest kind of physical punishment to achieve their purpose.

On our own side, the British have developed in their Commando troops a high grade of physical and

mental hardness. These, however, are specialists—shock troops, if you like—organized primarily as an amphibious raiding force.

Our program must include the training of every American soldier, or at least all members of combat units, to be physically and mentally tough. We have plenty of historical precedent. The original settlers, the pioneers, the frontiersmen, the Indian fighters—these were a tough breed. They had to be—to stay alive. Washington's men, who fought the French and Indians to a standstill in covering the retreat of Braddock's men, needed no hardening. They furnish an excellent example of the finished product—the ideal for which we strive. This type of soldier was available in quantity up to the end of the last century. The troopers of the 1st Volunteer Cavalry (The Rough Riders) were good examples. However, with the more intensive settlement of our country, the breed has become scarce. Today we must train our individual soldier, in order to re-create the frontier type. We have something to build on. The average American lad entering our Service is a far better man physically than was his father who served in World War I. Our national devotion to sports has built him up physically and quickened his reactions. He knows something of teamwork, something of personal contact from games like football, baseball and basketball, from sports such as boxing and wrestling. Many thousands of former Boy Scouts have had considerable training in outdoor life and in woodcraft.

The present program of physical training in effect in our Army, including obstacle courses, bayonet runs, marching and swimming, furnishes an excellent foundation for that further hardening which is best acquired in the action of small units. A definite program must be built up along this line. While many methods will suggest themselves, it is felt that the following are—or should be—mandatory:

1. Intensive training in night operations and movement, in particular, training in infiltration methods of small units.
2. Intensive training in dense woods, swamps, jungle country, and the like. (One method is to require a squad or a half squad to make a definite march through one of these types of country, entirely self-sustained. Another is to scatter a unit of this size, instructing individuals to report at a designated time and place. A third is to match two such units in maneuver against each other, on difficult terrain, with an agreed system of prizes and penalties. All these exercises should be repeated again and again, using progressively difficult conditions.)

WE WILL DO ANYTHING TO WIN THE WAR

3. Thorough training in tank-stalking.
4. Thorough training in street fighting.

All these have great value from the tactical standpoint, but it must not be overlooked that they are definitely of value in the hardening process.

We have spoken of the value of our American sports training from the physical standpoint. It must be recognized, however, that this same sports-mindedness is a severe handicap from the mental approach. Our code of sportsmanship has no place in war today, and this is nowhere better illustrated than in personal combat. In our scheme of things, foul tactics are not only frowned upon but heavily penalized. Our opponents have no such inhibitions. On the contrary, they have been taught that such ideas are evidences of softness—of democratic decadence. Whether we like it or not, we must instill the same spirit of mental hardness into our own troops. War is not a sport—and this is not a romantic war. In fact, let us be honest with ourselves and recognize the truth that we are fighting a gangster's war—and condition ourselves for it. It is granted that this type of training, this mental hardening, will set up difficult postwar problems. However, the immediate objective is to win the war. Subsequent problems will have to be solved if and when they arise. It might be said, in this connection, that our pioneer ancestors were rather hard-boiled fighting men, but they seem to have been pretty good citizens.

Each soldier must be trained to an attitude of kill or be killed. To this end there must be constant practice—possibly at the expense of standard forms of physical culture—in boxing (to include crippling foul blows such as the rabbit punch), in wrestling (to include the more successful methods of throttling), and in bayonet fighting. The use of the bayonet as a knife, and the use of the trench knife and of brass knuckles should be stressed. A skilled operative can do a great deal with a knife—among other things he can kill a man very silently. The technique of the club, the blackjack, and the sand-filled sock must be gone into thoroughly. Firearms adapted to personal combat should receive especial attention—periods should be devoted, for example, to the sub-machine gun. Thorough training must be given the individual armed and unarmed, in the several methods of disarming an opponent. FM 21-150—Unarmed Defense for the American Soldier will be found very valuable in this phase. Instruction, necessarily limited by the means available, must be given in the use and handling of enemy weapons, especially small arms. The properly trained soldier should know at least the balance and feel of the enemy rifle and pistol. Men should be practiced for long periods in the silent approach to an enemy—stalking. It must be impressed that in war any method which will accomplish the task at hand is fair, that every possible advantage must be taken of an opponent. Maximum use will be made

of dummies, especially in the early stages of this training, but the final periods must involve actual hand-to-hand fighting—contact work. Without question—in spite of the high state of physical training—this will involve training casualties. Troops should be educated to regard these as normally incident to such training. Let me repeat that this is not a romantic war.

Close-in combat with tanks may be considered an example of hand-to-hand fighting, Model 1942. Some tanks will get into our position despite all-antitank means. Our infantry will go tank-stalking.

Tanks are far from invulnerable to the attack of foot troops. The Ethiopians, practically naked savages, proved that against the Italians. Dry grass was fired, and bottles of gasoline previously ignited were thrown against tank openings. Tracks were jammed with iron bars or with rifle barrels. Crew members appearing outside the tank were promptly attacked with rifle fire and with knives. In the Spanish Civil War, grenades—singly or in bunches—dynamite—and other explosive and incendiary means were employed.

Tank-stalking, combining combat patrol and antitank tactics, is a comparatively new form of offensive action. It might be considered a form of raid. Tanks in bivouac or at an assembly point are literally hunted down and destroyed, much in the manner of big game hunting. Dismounted sentries are liquidated, the position over-run in a swift rush, and the tanks destroyed by fire and explosives.

Formerly, we taught foot troops on the defensive to use against tanks the same tactics which the Romans used to combat Hannibal's elephants—to crouch low in their foxholes, allow the tanks to go over unmolested, and rise to attack the supporting infantry. Today these infantrymen take the tanks in rear as they pass over—to throw grenades and bottles of flaming gasoline, to jam tracks, and to fire at vision slits and at periscopes. Note the change in attitude since World War I, when the mere appearance of a few tanks was enough to cause good infantry to retreat in disorder.

Whether it takes the form of tank-stalking, of battlefield infiltration, a raid to secure prisoners, or the use of bayonet and butt to clear an enemy position, hand-to-hand fighting takes guts—lots of guts. It's one thing to shoot at an opponent at even a comparatively short range, quite another to tackle him in personal combat. To develop guts—the will to win—the eagerness to engage the enemy toe-to-toe—we must train the American soldier to be hard—physically and mentally hard. Nothing less will win the war.

Let me close with a quotation from Amos Alonzo Stagg, eighty years old, and dean of American football coaches: "I feel the same way about football games as about winning the war—with this exception—we will do anything to win the war."

Notes on Essential Elements of Information and Indications

By

LIEUTENANT COLONEL PHILIP H. BETHUNE, *Cavalry*,
Instructor, Command and General Staff School.

These notes are merely intended to show the relationship between enemy capabilities, essential elements of information, and indications. In approaching this subject one should consider the following definitions.

Enemy Capability—Line of action of which the enemy is physically capable and which, if adopted by the enemy, can affect the accomplishment or manner of execution of our mission in a particular situation.

Essential Elements of Information—Information of the enemy, of the terrain not under our control, and of meteorological conditions in territory held by the enemy, which information a commander needs to make a sound decision, conduct a maneuver, avoid surprise, or formulate details of a plan of operations.

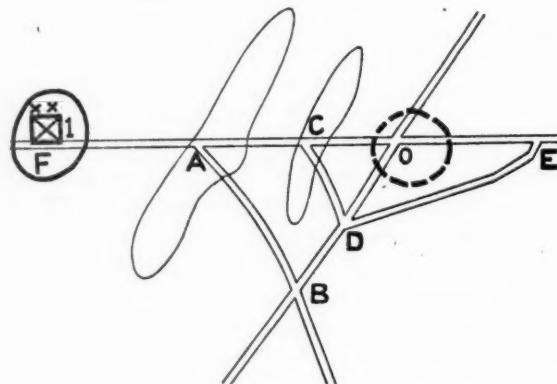
Indications—Enemy acts or dispositions which if discovered point out, or tend to show, that the enemy may be adopting a given line of action.

The essential elements of information constitute a directive upon which the collection of enemy information is based. Their formulation and announcement is a command function. The object of announcing essential elements is not to guess the enemy's intentions, but to furnish a basis for an investigation to determine what capability the enemy is adopting, or to secure information relating to terrain, weather, etc. This investigation is directed by G-2 who analyzes the essential elements of information and determines indications which will tend to show a positive answer to the particular essential element of information under consideration. These indications are the items of information which are ordered sought by subordinate units, or requested from higher and adjacent units.

The relationship between the enemy capabilities, the essential elements of information, and indications is illustrated by the following situations. In considering these situations, note that the more information available the more specific become the estimate of the enemy capabilities, the essential elements of information, and the indications.

SITUATION:

1st Infantry Division receives orders to seize objective O. No enemy has been discovered. No route reconnaissance has been made.



SCALE: 1 inch equals 10 miles.

ENEMY CAPABILITIES:

Enemy might be present in positions from which it could interfere with performance of mission of 1st Infantry Division.

ESSENTIAL ELEMENTS OF INFORMATION:

(1) What is the location of enemy forces capable of interfering with the 1st Infantry Division's seizing O? What is the approximate strength of such forces?

(2) What terrain obstacles will be encountered en route to O?

INDICATIONS:

(1) For 1st EEI.

Presence of enemy forces within an area from which they can move in time to interfere with 1st Division's seizure of O.

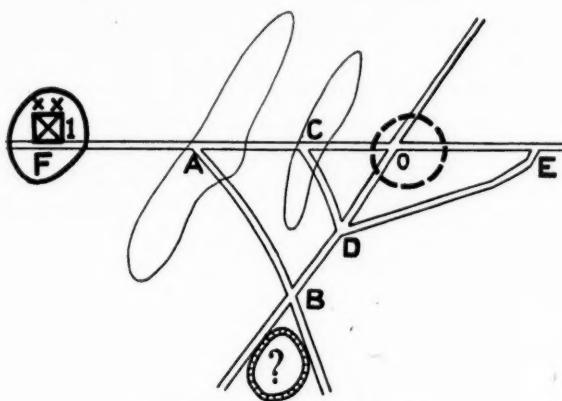
(2) For 2d EEI.

Unfordable streams, washed out or destroyed bridges, inundations along route, heavily wooded areas, strong defensive terrain which might be occupied by the enemy, etc.

NOTES ON ESSENTIAL ELEMENTS OF INFORMATION AND INDICATIONS

SITUATION:

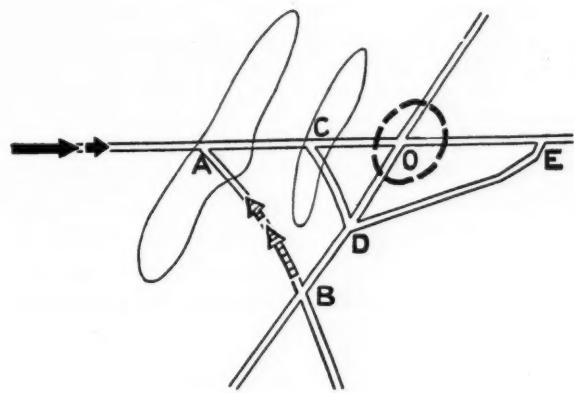
1st Infantry Division has not yet moved. An enemy of unknown strength has been located. No terrain obstacles have been located. Ground reconnaissance of the entire area, in which an enemy force which could interfere with the operation might be located, has not been completed.



SCALE: 1 inch equals 10 miles.

SITUATION:

The enemy, estimated as a division, is moving toward A. Ground reconnaissance indicates that no other hostile ground forces are in position from which they can interfere with the 1st Division's seizure of O.



SCALE: 1 inch equals 10 miles.

ENEMY CAPABILITIES:

- (1) The located force can *move* to interfere with the 1st Division in the vicinity of A, C, or O.
- (2) Additional enemy forces may be in positions from which they can interfere with the operation of the 1st Infantry Division.

ESSENTIAL ELEMENTS OF INFORMATION:

- (1) Will the Red force south of B *move* to interfere with the 1st Infantry Division in the vicinity of A, C, or O? If so, in what strength and at what time?

- (2) Are there any unlocated forces capable of interfering with the performance of the 1st Infantry Division's mission? If so, what is their strength, composition, and location?

INDICATIONS:

- (1) For 1st EEI.
 - a. Activity within bivouac area.
 - b. Movement of small reconnaissance parties toward A, C, or O.
 - c. Movement of troops toward roads leading to A, C, or O.
- (2) For 2d EEI.

Presence of additional forces within areas from which they can move to interfere with 1st Division's seizure of O.

ENEMY CAPABILITIES:

- (1) To act offensively against the 1st Division in the vicinity of A.
- (2) To block the advance of the 1st Division by defensive action in the vicinity of A.

ESSENTIAL ELEMENTS OF INFORMATION:

- (1) Will the enemy act offensively against the 1st Division in the vicinity of A? If so, what will be the strength and direction of his main effort?
- (2) Will the enemy act defensively in the vicinity of A? If so, what will be his dispositions with special attention to the location of flanks and size and location of reserves?

INDICATIONS:

- (1) For 1st EEI:
 - a. Aggressive reconnaissance especially around the flanks of the Blue force.
 - b. Deployment of hostile forces in relatively great depth on flanks or front.
 - c. Artillery in forward positions from which it can support advance into terrain held by Blue.
- (2) For 2d EEI:
 - a. Hasty fortifications on good defensive terrain.
 - b. Artillery disposed in relatively great depth.
 - c. Deployment of hostile forces in relatively great width.

MILITARY REVIEW

d. Reserves located in positions from which they can counterattack to repel attacking forces entering weak portions of the Red position.

e. Execution of demolitions and construction of road blocks on flanks.

SITUATION:

The enemy is defending. The Commanding General, 1st Infantry Division, has decided to envelop the enemy's north flank.

ENEMY CAPABILITIES:

(1) To continue to defend his present position using his reserves to counterattack.

(2) To withdraw at any time to a second defensive position near C.

(3) To employ all located reserves in an attack against the Blue south flank.

ESSENTIAL ELEMENTS OF INFORMATION:

(1) Will the enemy continue to defend his present position? If so, will he extend the north flank of his position? What is the strength of his reserves?

(2) Will the enemy attack the south flank of the 1st Division? If so, what will be the direction of the main effort and the strength of the force making it?

INDICATIONS:

(1) For 1st EEI.

a. Continued occupation of present position.

b. Work on trenches in front line, as well as in reserve area.

c. Erection of bands of wire.

d. Execution of demolitions on flanks.

e. Activity within or from the direction of reserve areas.

(2) For 2d EEI:

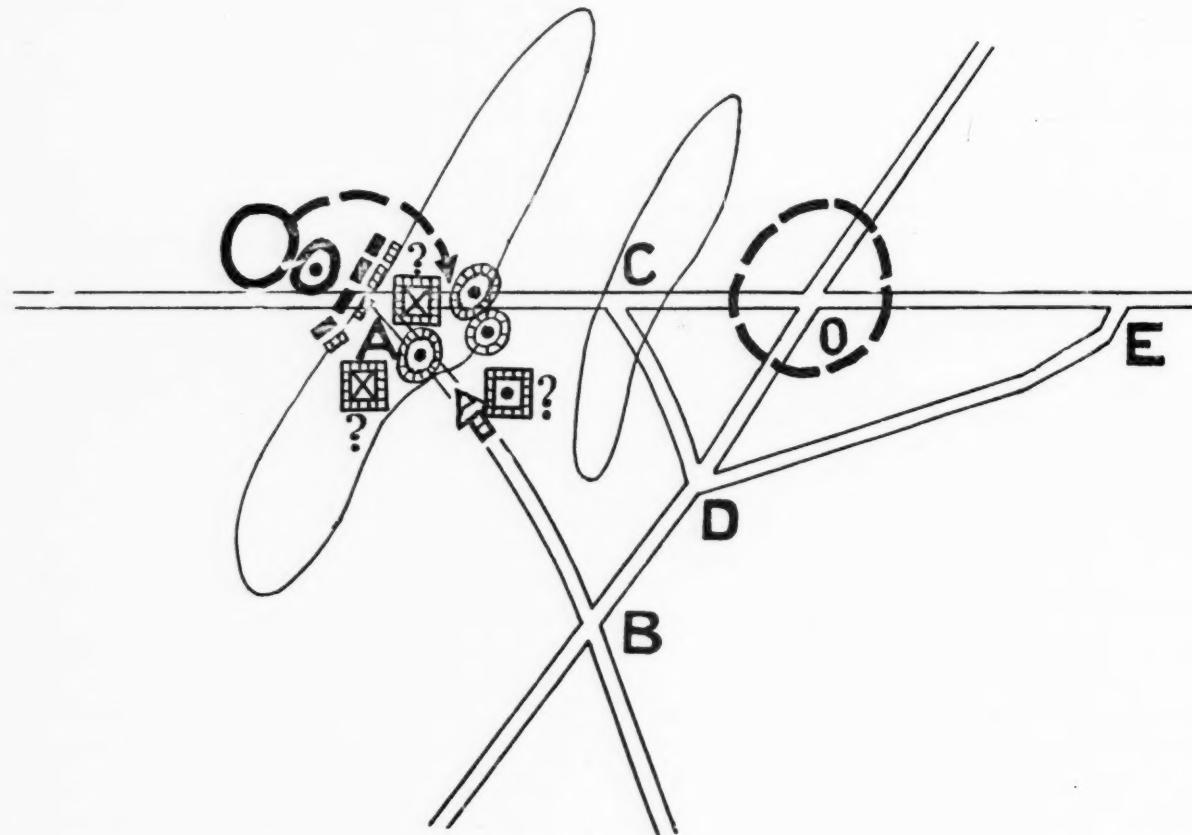
a. Increased activity near southern Red reserve.

b. Aggressive reconnaissance of the Blue south flank.

c. Movement of northern reserve to the south.

d. Artillery moving to positions from which it can support an attack on south flank.

e. Increased pressure against Blue south flank.



SCALE: 1 inch equals 5 miles.

Antiaircraft Artillery with the Field Forces

By

LIEUTENANT COLONEL D. S. ELLERTHORPE, *Coast Artillery Corps*,
Instructor, Command and General Staff School.

The Coast Artillery Corps has been charged with the development of army antiaircraft artillery since its inception as a component of our armed forces. Tributes to this task of development are the already legendary exploits of our antiaircraft artillerymen and their matériel during the operations of recent months. This is the beginning. Past accomplishment is but a stepping stone to future achievement. Rapid development of aircraft including greater speeds, higher altitudes, increased operating ranges and new methods of operation have imposed tremendous tasks in the effort to effectively combat the air threat with ground weapons.

The proper employment of antiaircraft artillery in any type of operation is predicated on a knowledge and understanding of aerial tactics. Aerial operations consist of reconnaissance and attack. Aerial attacks may be generally classified as follows:

- High altitude bombing.
- Low altitude bombing.
- Dive bombing.
- Low flying strafing attacks.

Each sizeable attack is preceded by aerial reconnaissance.

High altitude bombing is generally conducted by massed bomber formations at altitudes in excess of 15,000 feet. In the majority of instances the presence of antiaircraft artillery and fighters in the vicinity of the objective renders precision bombing so costly to the attacker that he releases his bombs without the preliminary straight sighting run necessary for precision. The result is area bombing, where each bomb dropped falls within the boundaries of the objective area and is not effective unless vital point installations are closely grouped. High altitude bombing in the forward part of the combat zone is exceptional as it is only in rare instances that remunerative targets are found here.

Low altitude bombing attacks are usually executed by flights of planes in "V," staggered line or trail formation at altitudes just above the effective range of automatic weapons, that is, from 5,000 to 7,000 feet. Parachute or delayed action bombs are employed in order to minimize the danger to attacking aircraft. Precision bombing is comparatively easy at these altitudes. General Doolittle's Tokyo visit is an example of a cleverly conceived and executed low altitude attack, within range of automatic weapons. The surprise was so complete in this case that his flights operated without effective antiaircraft artillery or fighter opposition. A particular ad-

vantage to be gained by low elevation approach is the relative inability of detection devices to pick up targets near the horizon, thus permitting an attacker to gain surprise. Variations of the low altitude attack may include ground strafing following the bombing run. Low altitude bombing attacks may be expected against marching columns, troop concentrations, bridges and other profitable targets in the combat zone.

Our navy originated dive bombing, but it remained for the Germans to develop the technique of this operation to the point of its present effectiveness. This attack is launched by single planes or large formations of planes, each plane directing its flight at some particular surface objective. Such attacks are extremely accurate when unopposed. The usual method of attack generally adheres to the following pattern:

Dive bombardment aircraft move in at high altitude to the vicinity of the objective area, lose altitude to elevations varying from 10,000 to 20,000 feet, then begin their diving run, out of the sun or clouds, if possible, at angles between 50 and 80 degrees from the horizontal. Each pilot dives his ship at a particular point target within the objective area and releases his bombs when at a distance of about 1,000 yards from the target. It is reported that in some instances Japanese pilots held their bombs until within 300 feet of their targets at Pearl Harbor. American pilots pushed home like attacks in the Coral Sea and Midway engagements. Dive bombing is a form of precision attack that may be expected against any vital objective within the combat zone. The Germans have repeatedly employed dive bombing tactics against antiaircraft artillery and field artillery emplacements, stubborn points of resistance in the path of their attacking ground troops, and against marching columns.

Strafing attacks are generally executed at tree top elevations. These attacks combine the fires of machine guns and aircraft cannon firing incendiary bullets and high explosive shells. This operation may be supplemented by delayed action fragmentation bombs against personnel. Our forces were on the receiving end of strafing attacks in Hawaii and the Philippines. Personnel, aircraft on the ground and inflammable ground installations were destroyed with such rapidity and completeness as to conclusively prove the effectiveness of this type of attack. The attack arrives with little or no warning at altitudes from 25 to 100 feet, speeds 200 to 400 miles an hour

and is the most difficult form of attack to combat. When warning is lacking, ground weapons are useless during the initial stage of the strafing attack. This attack may be expected at any time and against any target in the combat zone.

The foregoing classification does not include the many variations of attack which have proved highly successful. Combinations of any of the above methods are to be expected. The more unorthodox and varied the method, the greater are the chances of success. Ground forces must be prepared to meet any eventuality of aerial attack.

tant peace-time installations. The temporary installations of war are not generally known and must be discovered before they can become the targets for attack. It follows, then, that the first protective measure is to deny or limit the effectiveness of hostile aerial reconnaissance, as this method of gaining information is rapidly becoming more important and comprehensive due to developments in aerial photography.

Effective defense against aerial observation is a task involving both active and passive measures. Full knowledge of the benefits to be gained through



Photo by U.S. Army Signal Corps

90-MM ANTOIAIRCRAFT GUN, MI, ON MOUNT.

Obviously, the best defense against all types of attacking aircraft is defensive aircraft operating offensively to intercept hostile planes before they can launch their attacks. Both fight in the same medium where combat is most effective through contact at short range. Friendly fighters will not always be available for the desired interception; consequently the need for protection of vital ground elements must be met by the operation of suitable ground weapons especially designed to limit or deny the effectiveness of aerial attacks. Antiaircraft artillery not only functions in the absence of fighter protection but also augments the defensive efforts of fighter aircraft when present.

It is to be expected that an enemy will be in possession of complete information concerning impor-

the intelligent application of passive defense measures must be possessed by the personnel of all echelons. Commanders must impress passive defense discipline on their units because such discipline is requisite to survival. Active and passive defense measures are closely linked. Operating with restricted amounts of antiaircraft artillery will not permit active protection for all ground elements participating in an operation. Only those elements vital to the scheme of maneuver may be so favored. Less important elements will have to rely solely on passive defense measures, and the failure of any element to properly and diligently employ them may spell defeat for the force as a whole.

Principal passive defense measures consist of camouflage, concealment, dispersion, cover, slit

ANTIAIRCRAFT ARTILLERY WITH THE FIELD FORCES

trenches, warning, deception and numerous others. Principal active defense measures comprise antiaircraft artillery, fighter aviation, organic weapons in the hands of troops, and barrage balloons. Barrage balloons constitute the only active means not yet employed in the forward part of the combat zone.

The antiaircraft artillery protection of combat units from hostile aerial reconnaissance and observation is accomplished by the employment of antiaircraft guns (3 inches and greater in caliber) supplemented by antiaircraft automatic weapons (less than 3 inches in caliber). Automatic weapons are required to cover the air space between the ground and the minimum effective range of the guns in order to provide coverage from the ground up. Guns with their heavy mass of metal cannot be traversed, elevated and depressed with enough speed to track aircraft flying near the gun position at high speed and low elevation. Automatic weapons should always supplement guns in order that all altitudes may be adequately covered.

It will not generally be possible to mass antiaircraft guns in such a manner as to provide dense coverage for aerial observation protection of the battle area. While this arrangement is desirable, the limitation of available weapons will seldom permit more than a general coverage with batteries disposed near the center of important localities. Whenever possible the fires of adjacent gun batteries should overlap. This method can scarcely be expected to do more than keep reconnaissance aircraft so far away from the vital areas as to deny accurate information. In sighting batteries, alternate positions should be carefully camouflaged and frequently occupied. Dummy positions should be established in such a manner as to draw hostile attack. Numerous combat examples bear evidence to the effectiveness of dummy positions in drawing repeated attacks, while nearby batteries, carefully camouflaged, remained unmolested.

Caution must be exercised in employing antiaircraft fires. For example, let us assume that a unit has been well concealed in bivouac or assembly area through the adoption of passive measures, and that friendly aircraft has checked the effectiveness of the concealment and pronounced it satisfactory. It is apparent that prompt fires, executed by protective antiaircraft artillery in an attempt to drive away or knock down inquiring aircraft, will result in divulging the location of the concealed unit and thus invite further reconnaissance. When it becomes evident that hostile aerial reconnaissance has discovered the troops, fire should be commenced. Active antiaircraft defense measures must be so taken as to maintain secrecy concerning the disposition and scheme of maneuver of the ground forces. Air defense fires which divulge important information must be avoided.

Because of the fluidity of modern combat involving rapid changes in the positions of ground elements, all antiaircraft artillery with the field forces

should be highly mobile. This is in marked contrast to the defense of rear areas. In rear area defense frequent changes of position over long distances are exceptional and less mobile antiaircraft artillery is able to fill the need. Therefore, semimobile or static units lacking full complements of transportation are employed in rear areas.

In operations with the field forces in the combat zone, antiaircraft artillery protects troop concentrations, entrucking and detrucking areas, bivouacs, assemblies and routes of march. Because targets suitable to high altitude bombing attacks are rarely present in the forward part of the combat zone, protection against aerial attack is afforded by automatic weapons.

Lack of sufficient antiaircraft artillery will preclude protection for all ground elements. It is therefore advisable to classify the various elements of a force in priority of their importance to the particular operation at hand. Elements requiring priority classification are: front line troops, i.e., troops in contact; reserves which are invariably held for later decisive employment; supporting field artillery; command posts; supply installations. All of these elements should receive protection from aerial attack. The importance of each element to the scheme of maneuver of the entire force will change in accordance with its mission in different operations. Some of the elements possess organic weapons capable of furnishing effective protection and that fact must be considered in planning a defense in order to free antiaircraft artillery for the protection of units lacking organic means. Limitations in the aerial firing capabilities of weapons in the hands of troops often make it necessary to augment their fires with those of antiaircraft artillery. This is true of field artillery, which is always a primary target for unremitting aerial attack.

In offensive situations it is recognized that troops executing the main effort of the attack should receive priority for antiaircraft protection. This is sound practice as it permits advancing troops to concentrate on ground opposition and minimizes delay and disruption which might be occasioned were the troops attacked by unopposed hostile aircraft. Troops in contact, reserves, and field artillery supporting the main effort should receive highest priority in the offense.

In defensive operations it is a primary function of antiaircraft artillery to first protect the organization of the ground, then later the occupation of the battle position. The defender employs a general covering force well in advance of the selected battle position in order to deepen the defense. All defensive covering force action is designed to prevent early hostile development of the battle position in order to gain time for the defender. Lack of adequate air defense against aerial reconnaissance will neutralize a large portion of the effectiveness of covering force action. In the absence of such protection the enemy

may obtain early aerial information as to the location and extent of the main battle position, thus enabling him to launch a coordinated attack earlier than if denied information by antiaircraft artillery. Antiaircraft guns and automatic weapons must therefore be sited well forward in order to provide maximum opposition to attempted aerial reconnaissance during the organization of the ground. It is to be expected that the enemy will eventually determine the true location and extent of the battle position, and prepare his forces for a coordinated attack in the event he cannot accomplish his mission by avoiding the position. Guns may then be displaced rearward near the center of areas containing important defense elements and installations in order to better provide protection for the conduct of the defense. This includes protection for reserves, their expected routes forward, and field artillery located in depth within the position. Automatic weapons must be sited well forward within protected localities to defend troops in contact from aerial softening tactics directed at points of stubborn resistance. Reserves constitute the defender's primary means for influencing the conduct of the defense. In consequence it is to be expected that the enemy will concentrate every effort to locate the reserves, and that when found he will hit them with smashing air attacks, either in assembly areas or enroute to counterattack positions, thus neutralizing the effectiveness of that vital element of the defense, the counterattack. This makes it at once apparent that reserves must receive high priority for protection.

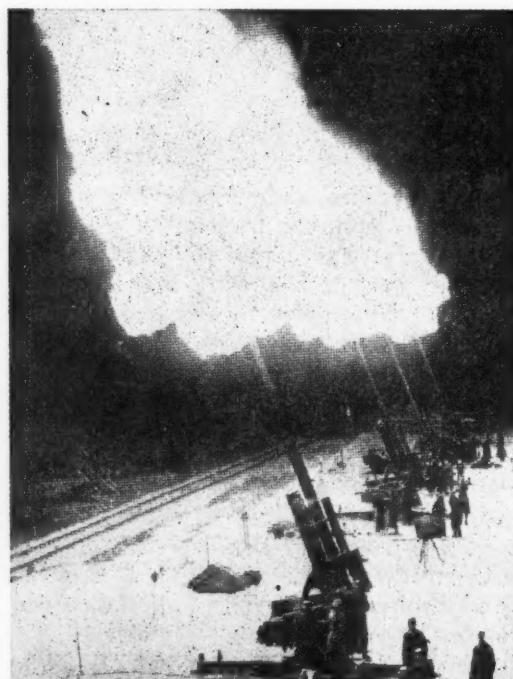
The air defense of marching columns presents a difficult problem. Protection is best attained by an umbrella of fighters. However, the probability that fighters will always be available when needed is so remote that the air defense of troop movement in the combat zone definitely requires antiaircraft artillery.

When protecting foot troops on the march antiaircraft units can leap frog along the axis of advance by means of rapid transport. Motor and mechanized columns move with such rapidity that "leap-frogging" is out of the question. The exceptional presence of close-in parallel routes does not completely furnish a solution to the problem due to the rapidity of movement. Motor and mechanized columns must therefore provide a large measure of their own protection through the application of passive defense measures. These measures include night movement, speed of movement, extended distances between vehicles, and multiple columns. However, marches cannot be confined solely to hours of darkness and seldom will road nets permitting desired dispersion be encountered. A wholly protected route of march is the answer, but means to supply protection for entire routes are generally lacking. Defiles such as bridges, mountain passes and causeways along routes of march must therefore receive first priority for antiaircraft artillery protection, as it is here that the

movement of columns is restricted and the force is most vulnerable to air attack.

The need for antiaircraft artillery will most often exceed the available means. An applicable method of procedure is to provide protection for elements of highest priority, that is, those elements whose operations are most vital to the successful completion of the assigned mission of the force as a whole. In the offense this will most generally be the force making the main effort. In the defense, reserves and field artillery are first considered. It is poor practice to spread antiaircraft artillery thin in an attempt to furnish some protection for all elements of a command. The resulting arrangement will not provide adequate protection for any of the elements. Antiaircraft artillery should be concentrated in its employment, not dispersed beyond effectiveness.

The foregoing principles apply most generally to infantry and motorized divisions. In what respect then do principles of antiaircraft artillery employment differ in application to armored force operations? The chief difference lies in the fact that the protection of armored unit supply installations must be emphasized. Until battle experience proves that tanks, which are equipped with light antiaircraft weapons, are so vulnerable to air attack as to require reinforcing antiaircraft artillery, the supply and service echelons of those divisions should receive priority. This does not mean that the protection of defiles along the routes of advance of armored units will be neglected. Such localities must be strongly protected. In combat, there are two supply and serv-



GERMAN 88-MM ANTIACRAFT BATTERY IN NIGHT ACTION.

ANTIAIRCRAFT ARTILLERY WITH THE FIELD FORCES

ice echelons within each armored division. The rear echelon, consisting of the division field trains with attached elements of unit trains not immediately essential to combat, is located at some distance in rear of the fight. The forward echelon train consists of a portion of the unit trains and a few reinforcing division train elements necessary to sustain operations of the combat vehicles. The forward echelon trains operate in very close support during combat. Both echelons carry reserve supplies of gasoline, lubricants and ammunition, life blood of the armored division. Aerial attacks which succeed in destroying these vital supplies succeed in immobilizing the armored division. Armored units immobilized on the battlefield do not survive to fight again. It is therefore obvious that in addition to dispersion and organic weapons, antiaircraft artillery must be counted upon to protect vehicles of the supply echelons of armored divisions.

It is evident that concentrations of antiaircraft artillery for the protection of the most vital elements of a force will leave lesser important elements without desired protection. The lesser important ones will therefore have to rely solely on their organic weapons and passive measures. No hard and fast rule can be followed in apportioning antiaircraft artillery. Each situation presents a different problem requiring an individual solution.

We no longer need imagine the destructive potentialities of a surprise aerial attack. We have been on the receiving end of such attacks, and numerous other examples have recorded the devastating effects of these surprise operations. To be effective, antiaircraft artillery must be forewarned of impending attack. Each antiaircraft artillery regiment or corresponding unit is provided with personnel and equipment for the purpose of supplying essential warning for its own use and that of neighboring units. Radio detectors and sound locators comprise the primary observation facilities of a warning system, chief reliance being placed on the former. The system set up constitutes a close-in warning service not to be confused with the more extensive Aircraft Warning Service covering large areas. All ground units employ twenty-four hour air guards whose functions supplement the local warning services. When two or more antiaircraft regiments operate in proximity, their warning service should be closely coordinated to provide more complete and continuous coverage. Antiaircraft regiments will not usually be attached to divisions, but the information obtained from the intelligence facilities of those regiments will be available to divisions.

Antiaircraft searchlights have no place in the forward part of the combat zone. Inability to place effective illumination on low flying targets coupled with the danger of illuminating friendly objectives and installations within the battle area offset any doubtful advantage to be gained by such employment.

Searchlights are properly employed farther to the rear to illuminate hostile aircraft for antiaircraft gun fire. They are also employed on cooperative missions with fighters for the sole purpose of illuminating enemy planes for interception.

The Germans were the first to use antiaircraft artillery for antimechanized defense. Later they employed units of this arm with their assault echelons to reduce concrete fortifications and other strongly defended emplacements. Finally they initiated its use as direct support artillery. It is obvious that their antiaircraft artillery weapons could not have been diverted from the normal mission of air defense had they been confronted with a real air threat. German control of the air has made this employment possible in the past. The effectiveness of their antiaircraft weapons against ground targets has been achieved through special design for dual operation of the weapons so employed. Antiaircraft guns and automatic weapons designed solely for air defense possess inherent limitations which greatly restrict dual employment. Guns and automatic weapons have high muzzle velocities, flat trajectories, high rates of fire and 360° traverse, all of which are highly desirable antitank characteristics. Characteristics limiting dual employment are high silhouettes, lack of sufficient mobility to permit rapid change of position, and lack of stability during low angle fire which may disturb gun orientation requisite for antiaircraft fire. Force commanders must understand and appreciate these limitations when assigning primary ground missions to antiaircraft weapons.

The primary mission of all antiaircraft weapons whether single or dual purpose is normally air defense. During weather conditions which restrict flight, the absence of aerial threat, or the predominance of the mechanized threat, the force commander may be justified in assigning a primary mission of antimechanized defense to antiaircraft artillery. In other situations involving the primary assignment of ground missions, the commander should carefully consider the disadvantages of such employment. When both aerial and mechanized attacks are hostile capabilities, antiaircraft artillery should retain its primary mission of air defense with the understanding that regardless of the priority of missions fire is always placed on the most immediate threat. All antiaircraft units are trained in antimechanized as well as air defense and habitually search for localities from which both missions can be executed. A percentage of armor-piercing projectiles is supplied to antiaircraft artillery units for antitank purposes.

The need for antiaircraft artillery by all field force echelons has been clearly established. This need is met by providing antiaircraft artillery with automatic weapons battalions either by assignment or attachment to divisions with larger AA units operating as an organic part of Army Corps and

MILITARY REVIEW

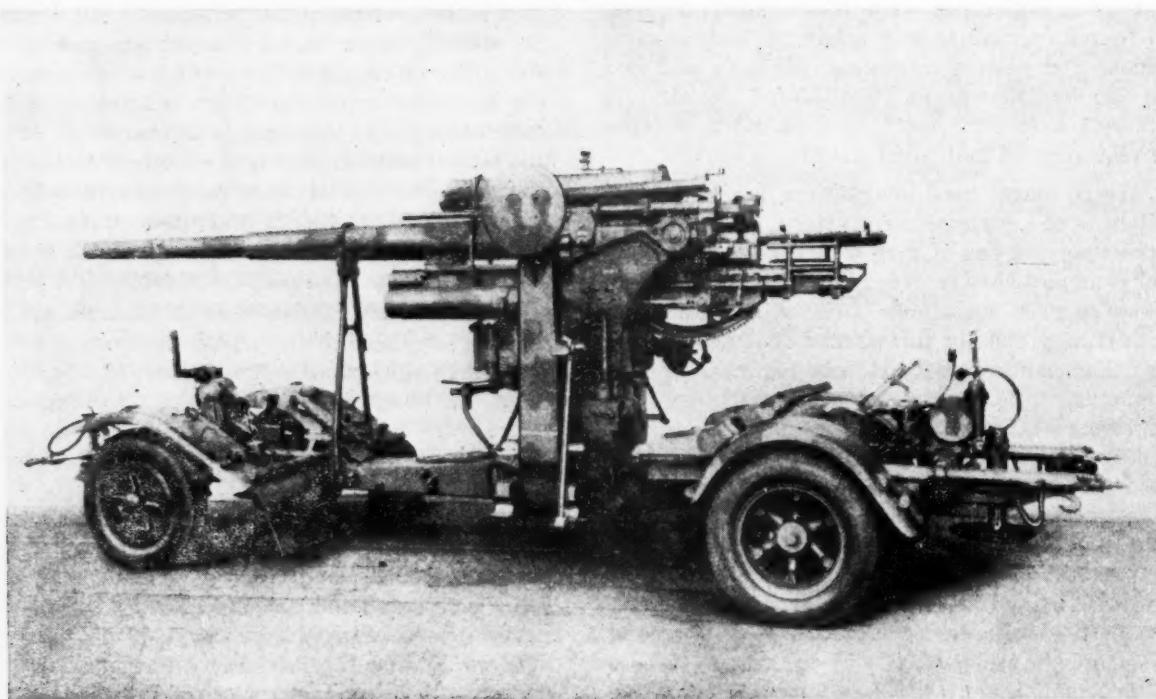
Armies. In addition, air borne and air transport divisions must be supplied with special antiaircraft units designed particularly for air transport and the protection of landing fields.

In all situations involving employment of anti-aircraft artillery and fighters in the air defense of identical objectives, a high degree of control is necessary to prevent friendly fighter casualties. Because of the ability of fighters to operate at a distance from the defended locality, the Fighter Command is charged with establishing this control. Antiaircraft artillery functions under operational control of the Fighter Command, and provides assisting personnel to that agency. Operational control consists essentially of orders from the Fighter Command to withhold fire. Emergency air ground signals must supplement established control to further minimize hazard to friendly aircraft. Control measures must

be simple, direct, and capable of immediate application.

Modern warfare with attendant demands for ingenuity and imagination on the part of leaders, portends failure for those commanders who neglect full consideration of the potentialities and limitations of all weapons provided for their use.

The establishment of antiaircraft priorities and missions is a function of the force commander. An understanding of the capabilities and limitations of antiaircraft artillery and a knowledge of doctrine and principles involved in its employment will enable him to properly employ his antiaircraft artillery in all types of operation. The commanders of assigned or attached antiaircraft units, and the antiaircraft artillery officers of the higher echelons, advise and assist the force commander in this task.



THE GERMAN 88-MM ANTAIRCRAFT GUN ON WHEELS.

Justice in a War-Time Army

PREPARED UNDER THE DIRECTION OF
THE JUDGE ADVOCATE GENERAL, *Army of the United States*.

"Justice ought to bear rule everywhere, and especially in armies; it is the only means to settle order there, and there it ought to be executed with as much exactness as in the best governed cities of the kingdom, if it be intended that the soldiers should be kept in their duty and obedience."

So wrote Louis de Goya in *The Art of War*, published in 1678. These words apply as well today as in the seventeenth century. It is essential to the success of military operations that the army's relations with the civilian populace be free from violence and plunder, that the army be free from internal violence and disorder, and that the orders of military superiors be obeyed promptly and without question. It is vital to the morale of the army that the soldier be assured of freedom from tyranny, caprice and oppression on the part of his superiors. To secure these ends the army must have a system of criminal justice which is swift, sure and scrupulously fair.

With *Magna Charta* and the *Bill of Rights*, America inherited from England its system of military justice. As feudal levies were replaced by a Royal Army in the years between the Middle Ages and the American Revolution a system of government for the English army was developed, embodied in a code of regulations promulgated by the King, called the *Articles of War*. On June 30, 1775, two weeks after the appointment of George Washington as Commander in Chief of the new American Army and more than a year before the adoption of the *Declaration of Independence*, the Continental Congress enacted a code of *Articles of War* copied, in the main, from the British articles in 1774. These first American *Articles of War* were revised in 1776. Other revisions followed in 1806, 1874, and 1916. The Army of the United States is now governed by the *Articles of War* which form a part of the *National Defense Act* of 1920 and which follow closely the 1916 articles.

The *Articles of War* establish a system of military courts—general courts-martial, special courts-martial, and summary courts-martial—for the investigation, trial and punishment of offenses committed by officers, nurses, warrant officers and soldiers of the Army of the United States, persons serving with the Army in the field, enemy spies captured by the army, and persons who give aid and

comfort to the enemy. The Articles provide for the composition, appointment, jurisdiction and general procedure of these military courts, enumerate the offenses for which they may punish, prescribe the punishments which may be imposed for some offenses, and establish a system of automatic appellate review of their proceedings. Article of War 38 empowers the President of the United States to regulate the detailed procedure, including modes of proof, of military courts; and Article of War 45 authorizes him to prescribe maximum limits of punishment for offenses the punishment for which the *Articles of War* leave otherwise to the discretion of the court. Acting under this authority the President has promulgated by executive order the *Manual for Courts-Martial*, 1928, which is, therefore, the authoritative treatise and regulation on the administration of military justice in the Army of the United States. The Manual contains a copy of the *Articles of War*, definitions of the offenses denounced by the Articles, instructions as to the preparation and investigation of charges of violation of the Articles, detailed regulations governing the appointment, composition, procedure and rules of evidence of military courts, a table of maximum authorized punishments, and rules for examination, review and action upon records of the proceedings of such courts. Every officer of the Army should be thoroughly familiar with the *Manual for Courts-Martial*. As the Army Regulations of 1835 put it:

"The discipline and reputation of the Army are deeply involved in the manner in which military courts are conducted and justice administered. The duties, therefore, that devolve on officers appointed to sit as members of courts-martial are of the most grave and important character. That these duties may be discharged with justice and propriety it is incumbent on all officers to apply themselves diligently to the acquirement of a competent knowledge of military law, to make themselves perfectly acquainted with all orders and regulations, and with the practice of military courts."

OFFENSES

The offenses made punishable by the Articles of War fall into two groups, those which are crimes and, if committed by civilians, would be punished by the civil courts, and those which are essentially

MILITARY REVIEW

military offenses. The crimes denounced by the Articles are familiar to well-read civilians; their definitions, derived from the common law of England, are set out in the *Manual for Courts-Martial*. Among them are treason, murder, rape, manslaughter, arson, burglary, housebreaking, robbery, larceny, embezzlement, perjury, forgery, sodomy, dueling, assault and battery, riot, defrauding the Government, and willful destruction of property.

The strictly military offenses are less well known. Some, such as fraudulent enlistment, making false returns, disrespect toward superior officers, disobedience of orders, mutiny, refusal to keep prisoners, loss or sale of military property of the United States, drunkenness on duty, being found drunk or asleep while posted as a sentinel, using provoking speeches or gestures, and failure to suppress mutiny, are reasonably self-explanatory and may be committed in time of peace or war.

Some other strictly military offenses which occur in both peace and war time are less well understood. Desertion and absence without leave have in common the essential element of being absent from a post of duty without proper authority; desertion requires the added element of an intent either to remain absent permanently or to shirk important service. Every officer should take pains to learn the amount and type of evidence necessary to prove such intent. Complete understanding of the offenses of conduct unbecoming an officer and a gentleman, disorders and neglects to the prejudice of good order and military discipline, and conduct of a nature to bring discredit upon the military service, denounced by Articles of War 95 and 96, involves a thorough knowledge of the history, customs and usages of the military service. Officers should strive to learn and follow the high code of honor which the Army demands of its officers; they should instruct their men thoroughly in the rules of behavior which apply to members of the honorable profession of arms.

In time of war the soldier may be guilty of other offenses in violation of the *Articles of War*. Cowardice in the face of the enemy, compelling a commander to surrender, betrayal of a countersign, appropriation of or dealing in captured property, aiding the enemy, or acting as a spy for the enemy are among these violations. Another is the offense of forcing a safeguard. A safeguard is a detachment, guard, or detail posted by a commander for the purpose of protecting some person, place or property or a written order left by a commander with an enemy subject or posted upon enemy property for the protection of the individual or property concerned. For example, in 1862 General McClellan of the Union Army placed a guard on the house occupied by Mrs. Robert E. Lee, wife of the Confederate General, and ordered that she and her household should not be

molested. A Union soldier who took provisions from this house or injured the occupants would have been guilty of forcing a safeguard.

MILITARY COURTS

In addition to recognizing the authority of military commissions, which are tribunals set up normally to try persons not connected with our own forces for violations of that part of international law known as the law of war, the *Articles of War* establish four types of military tribunals for the trial of offenses which the Articles denounce: general courts-martial, special courts-martial, summary courts-martial and commanding officers acting under Article of War 104. This article empowers the commanding officer of any detachment, company or higher command to impose disciplinary punishments for minor offenses upon persons of his command without the intervention of the court-martial, unless the accused demands trial by court-martial. Such punishments may include admonition, reprimand, or withholding of privileges, extra fatigue, restriction to certain specified limits or hard labor for not exceeding one week, but not, except as to forfeiture of pay by junior officers in time of war, forfeiture of pay or confinement under guard. Prior punishment under Article of War 104 may be considered in the imposition of punishment by court-martial for offenses growing out of the same act or omission.

A summary court-martial is composed of one officer, appointed by the commanding officer of a garrison, fort, camp or other place where troops are on duty, or of a regiment, detached battalion, detached company or other detachment, or by superior authority. It may try privates and non-commissioned officers below the grade of technical sergeant, provided the latter do not object, for any offense under the *Articles of War* not punishable by death but it may not sentence to confinement in excess of one month, restriction to limits for more than three months, or forfeiture or detention of more than two-thirds of one month's pay.

A special court-martial is composed of three or more officers, appointed by the commanding officer of a district, garrison, fort, camp, or other place where troops are on duty, or of a brigade, regiment, detached battalion, or other detached command. It may try enlisted men for any offense under the *Articles of War* not punishable by death or by a mandatory punishment beyond its power to inflict, but it may not sentence to confinement in excess of six months or forfeiture of more than two-thirds pay for six months.

A general court-martial is composed of five or more officers, appointed by the President of the United States, the commander of a department, army, corps, division or separate brigade, the Superintendent of the Military Academy (for trial of cadets and enlisted men), or the commander of an

JUSTICE IN A WAR-TIME ARMY

important district or force specially empowered by the President. It may try any person subject to military law for any crime or offense made punishable by the *Articles of War* and any other person who by the law of war is subject to trial by a military tribunal. A general court-martial may sentence to any punishment authorized for the offense involved.

The *Articles of War* require the appointment of a trial judge advocate, who is the official prosecutor, and a defense counsel for each general and special court-martial. Assistants to each may be appointed for general courts-martial. The order appointing a general court-martial must name one of the members thereof as law member, preferably an officer of The Judge Advocate General's Department. The provision requiring that a law member be designated is mandatory, but the *Articles of War* do not require that the law member be present during the trial unless so required in the order appointing the court. The law member rules on all objections and motions and his ruling on the admissibility of evidence is final. If objection is made to any ruling of the law member on an interlocutory question, other than the admissibility of evidence, the question is voted on by the members of the court *viva voce* in closed session beginning with the junior in rank. The matter is determined by majority vote and a tie vote is a vote in the negative. In the absence of the law member of general courts-martial and in special courts-martial, the president rules on all questions, subject to objection by the other members of the court. The president of the court is primarily responsible to the appointing authority for the conduct of the trial and he in turn requires the trial judge advocate to conduct the trial in accordance with law and regulations.

PRE-TRIAL PROCEDURE

A prosecution for violation of the *Articles of War* is commenced by preferring charges against the accused person. A charge is a written statement of the article violated, accompanied by a specification, which is a written statement of the acts which constituted the offense charged, prepared in the form prescribed by the *Manual for Courts-Martial*. Charges and specifications must be signed by a person subject to military law: that is, a member of or a person serving with the Army, who must state under oath that he has personal knowledge of, or has investigated, the matters stated in the charges and specifications and that they are true in fact, to the best of his knowledge and belief. This person is known as the accuser.

After the charges and specifications have been prepared and sworn to, they are transmitted to the commanding officer exercising summary court-martial jurisdiction over accused, usually the regimental commander, for a thorough and impartial investigation. The regimental commander may conduct the

investigation personally or, as is customary, detail some other officer to investigate the charges and specifications. The accused is entitled to be present at the investigation, to be confronted by the witnesses against him, and to be shown any documentary evidence against him. He may cross-examine the accusing witnesses and he may introduce witnesses in his own behalf. He must be carefully warned of his rights and may or may not make a statement, but, if he does make a statement, it may subsequently be used against him if trial results. If the investigation is made by an officer other than the regimental commander of the accused, the report of investigation is then forwarded to the regimental commander who determines what disposition he will make of the case. If trial by general court-martial is deemed advisable, the charges and specifications are forwarded to the authority competent to appoint a general court-martial for the command, who, prior to any action thereon, refers the charges and specifications to his staff judge advocate for consideration and advice. If accused is charged with a minor offense, the company commander may dispose of the case under Article of War 104. If the case does not involve a serious military offense or the offense is not one involving moral turpitude, the regimental commander may refer the case to a summary or special court and in some instances may dispose of the case himself under Article of War 104.

All cases should be investigated carefully but punctually and referred to trial at the earliest possible date. Promptness in the imposition of adequate and appropriate punishment is most important for the effective administration of military justice.

If after examination of the charges and specifications, the staff judge advocate recommends trial by general court-martial and the commanding general concurs, the charges and specifications are referred to the trial judge advocate of the appropriate general court-martial, for trial. He receives the charges and related papers and examines the charges and specifications to see that they are properly drawn and are without minor errors or irregularities. The trial judge advocate also examines the statements of the witnesses to ascertain what testimony he may expect and what additional testimony is necessary. Upon receipt of the charges and specifications, he promptly serves a copy thereof on the accused and copies of the other related papers, if any, that are available. In time of peace, an accused person may not without his consent be tried until five days have elapsed from the date of service upon him of the charges and specifications.

The accused should also be advised of his right to be defended by the regularly appointed defense counsel and by counsel of his own selection, military or civilian, if he so desires. Request for additional military counsel will be granted if practicable. If

civilian counsel is employed, it must be at the expense of the accused. Defense counsel are constituted legal advisers of the court, equally with trial judge advocates, and in general should be of military rank at least equal to that of the prosecutors. The theory is that it is just as much the duty of the Government to provide for the defense of a soldier under charges as for his prosecution.

It is the duty of the defense counsel to defend the accused by all legitimate methods known to the law. The position of the defense counsel is of great importance; on him falls much of the burden of ensuring that a trial by court-martial is a fair, impartial, complete examination of all the relevant evidence, not a mere sham. No officer appointed as defense counsel should ever feel that routine or perfunctory performance of his duties is enough. He must use initiative to find every possible defense and every bit of evidence favorable to the accused; he must press the defenses with vigor; he must conduct the defense with as great care as if his own life, liberty and honor were at stake. A defense counsel should consider the problem very carefully before allowing the accused to become a witness or to make an unsworn statement, for an innocent man may often damage his own defense by showing fright or confusion.

TRIAL PROCEDURE

The procedure in special and summary courts-martial is as far as practicable the same as that prescribed for general courts-martial. However, in a summary court there is no prosecutor and usually no defense counsel. The court reads the charges and specifications to accused, asks him how he pleads, and conducts the trial.

A trial by general or special court-martial is similar to the ordinary criminal trial in any Federal court, except that in a court-martial trial the court sits both as the judge and the jury. The court convenes promptly at the hour set and is seated usually at a long table. The president, who is always the highest ranking member, sits at the center of the table, the law member is always seated on the president's left, and the other members sit alternately in order of rank from right to left. The president calls the court to order and the accused is then asked if he desires to introduce individual counsel and if the services of the regularly appointed defense counsel are desired. If not, they are excused. The reporter is sworn and accused is asked if he desires a copy of the record of trial, to which he is entitled at government expense. The order appointing the court is then usually read and the names of the members present announced. If any members are absent, the reasons are indicated. The trial judge advocate announces the substance of the charge in order to ascertain whether or not any of the members of the court have been connected with the case during its preparation. The name of the investigat-

ing officer, accuser, and forwarding officer are announced, and any member of the court who has formed an opinion with respect to the case is required so to state. The accused as well as the Government has one peremptory challenge and may challenge any member of the court for cause. The law member may not, however, be challenged peremptorily.

After challenges have been disposed of by the court, the trial judge advocate and his assistants are sworn. The accused is formally arraigned on the sworn charges and specifications and pleads. If accused has any special plea to make, such as a plea to the jurisdiction, a plea in abatement, or a plea in bar, it should be made and disposed of prior to the arraignment. Whenever it appears to the court that a plea of guilty may have been entered improvidently or through lack of understanding of its meaning and effect, or whenever an accused, after a plea of guilty makes a statement to the court, in his testimony or otherwise, inconsistent with the plea, the president or the law member, if so directed by the president, will make such explanation and statement to the accused as the occasion requires. If, after such explanation and statement, it appears to the court that the accused in fact entered a plea improvidently or through lack of understanding of its meaning and effect or accused does not voluntarily withdraw his inconsistent statement, the court will proceed to trial and judgment as if he had pleaded not guilty. If accused pleads guilty the court will explain to him the meaning and effect of his plea. The rules of pleading and of evidence are similar to those of the United States District Courts. The trial judge advocate and the defense counsel may make opening statements. Witnesses are examined and cross-examined and the trial proceeds as in an ordinary criminal trial in a Federal court. When the prosecution has completed its evidence the defense may move for a finding of not guilty. If such a motion is submitted, the defense may be required to indicate specifically wherein the evidence is legally insufficient.

When the accused enters a plea in bar of trial on the ground of insanity or if at any time before the court announces an acquittal or imposes a sentence, the question of mental responsibility is raised, the court should determine the matter as an interlocutory question after receiving further evidence in connection therewith. Upon a finding of insanity, at the time of commission of the offenses, the accused should be forthwith acquitted. If found insane at the time of trial only, the proceedings are suspended and forwarded to the appointing authority for such action as he believes appropriate.

In the course of the trial, the accused may remain silent, he may make an unsworn statement, or he may take the stand and be sworn as any other witness. Unless he takes the stand and is sworn as a witness he is not subject to cross-examination.

JUSTICE IN A WAR-TIME ARMY

When the defense and prosecution have no other testimony to offer or witnesses to call, closing arguments may be made. The court is then closed, and the members vote on the findings of each specification and each charge. In order to prevent junior members of the court from being influenced by the vote of a senior officer, the vote is by secret written ballot. Unanimity is not required for a conviction, except of an offense for which the death penalty is mandatory. For all other findings of guilty, a two-thirds vote only is necessary.

The court, having reached its findings, is then opened. If accused is found not guilty, it is so announced; if accused is found guilty of any specification and charge, the president asks the trial judge advocate if he has anything further to present. The trial judge advocate then announces any previous convictions which legally may be considered by the court and reads such data as accused's age, pay and service, as may be shown on the first page of the charge sheet. The court is then again closed and vote is taken on the sentence by secret written ballot. A sentence to death requires a unanimous vote; a sentence to confinement in a penitentiary for life or more than ten years requires a three-fourths majority; and all other sentences a two-thirds majority. The court, having agreed upon a sentence, is opened and the findings and sentence announced unless, in the court's opinion, good reason exists for not making the findings and sentence public at that time. In this event, the president may state in open court that the findings and sentence are not to be announced.

Should the defense desire to submit a recommendation for clemency, it should be in writing and should show specifically the amount and character recommended and the reasons therefor. If any member desires to do so, he may sign the recommendation, which is then attached to the record of trial.

When the record of trial is transcribed, it is examined by the defense counsel and initialled, read and subscribed by the president of the court and the trial judge advocate and then transmitted to the appointing authority who ordered the trial or his successor in command.

APPELLATE PROCEDURE

No sentence of court-martial, general, special or summary, may be carried into effect until approved by the officer who appointed the court or his successor. This officer, upon reviewing the record of a special or summary court-martial, may approve the sentence of the court and order it executed, or if he thinks proper, he may disapprove all or part of the sentence, suspend the execution of all or part of the sentence, reduce the sentence, or order a new trial.

Records of trials by general court-martial must be submitted by the appointing authority to his staff judge advocate or The Judge Advocate General of

the Army for review. After receiving the recommendation of his staff judge advocate or The Judge Advocate General, the appointing authority approves, disapproves or suspends all or part of the sentence or orders a new trial. In less serious cases he may then order the execution of the sentence, in full or as modified by him. Thereafter the record of trial is sent to The Judge Advocate General of the Army in Washington, examined in his office, and if it is there found to contain errors adversely affecting the substantial rights of the accused, steps are taken by The Judge Advocate General to vacate, reduce or modify the sentence.

With minor exceptions, sentences affecting a general officer or extending to dismissal of an officer, suspension or dismissal of a cadet, or death may not be ordered executed until confirmed by the President of the United States. The appointing authority, before ordering the execution of sentences in such cases and in cases involving dishonorable discharge not suspended or confinement in a penitentiary, must send the record of trial to The Judge Advocate General of the Army for examination by a statutory board of review in his office. This board, composed of three judge advocates, examines each record with great care and reports its opinion to The Judge Advocate General, who recommends appropriate action to the President in cases requiring confirmation by him and in other cases authorizes the appointing authority to order all or part of the sentence executed or requires it to be vacated. In certain large commands operating in distant foreign countries the functions of the President, The Judge Advocate General of the Army and the Board of Review are exercised by the commanding general, an Assistant Judge Advocate General and a Board of Review in a branch office of The Judge Advocate General established with the command.

The system of automatic review prescribed by the *Articles of War* assures the soldier tried by general court-martial that the record of his trial will be read and considered by at least two authorities, trained in military law, and his sentence vacated or modified if the court has erred in his case. These reviews are automatic and without expense to him. The defendant tried for crime by a civil court has no such guarantee of fairness and justice.

CONCLUSION

The problem of administering military justice is not so much to prevent excessive punishment as it is to avoid unnecessary trials, particularly at this time when our mission is to train and prepare our armed forces for combat. Reviewing authorities may and do reduce excessive sentences, but it is the company commander who has most to do with reducing the number of trials, for he is usually the first officer to whom knowledge comes of misconduct of his men. It is he, therefore, who usually decides in the first instance whether an offender shall be

tried. As a rule, the best organizations have the fewest trials. Ready resort to the court-martial as an aid to discipline too often reflects laziness, inefficiency, and lack of the true qualities of leadership upon the part of the commander. Discipline is largely a question of leadership. An alert, sym-

pathetic and firm company commander can control his men, except in rare cases, without preferring charges. The officer who is a true leader of men maintains effective discipline and high morale by inculcating an intense desire to obey rather than by upholding threats of punishment.

Age and Field Command

BY
ALFRED VAGTS

(Reprinted from the *Journal of American Military Institute*, Spring, 1942.)

Even a superficial analysis of the reasons advanced for the employment of generals of long experience and advanced age will reveal a variety of non-military motives. A general may be retained out of sheer conservatism, to which democracies, as de Tocqueville once warned, are as likely to succumb as are absolutisms. "Leave well enough alone," the governors think; "success has clung to this soldier." Very likely their high opinion of him is traditional and without new tests of his abilities. Bother-some military innovators are displeasing to civilians, parliamentary and otherwise, who prefer to have the unpleasant business of war management run smoothly along accustomed lines. It is often held that military experience can be accumulated, even though war is itself both changed and changing without pause. Finally, it seems "only just" to civilians and soldiers alike that past performance should be recognized and that only under the harsh experience of defeat should a government abruptly discard a once deserving officer.

Has military experience in its accumulation through age and prolonged service proved its worth in the past? A few generals of advanced age have indeed achieved victories, the great and misleading example being that of the elder Moltke; others who come to mind are the Prussian Blücher, the Russian Suvorov and the Austrian Radetzky. All three were chosen and retained (by governors civilian and military) because of the patriarchal nature of the systems of government and authority prevailing in their respective countries. The presence of elderly officers in the field and at the head of armies could always be pointed out to the *Landwehr* and other higher age groups in the rank and file of these armies as a justification for their own field service while in their thirties and forties. The long-range record of military history speaks clearly against the army leader of advanced years, though, of course, not absolutely in favor of youth—youth does not safeguard against military folly. In general the great field commanders of history have been middle-aged at most, and so have the military organizers of victories and the reorganizers of armies. The following summary, divided into periods, shows that in many cases the initiative which brings victory is associated with relative youthfulness.

1. *Antiquity.* Themistocles was 26 at Salamis, Leonidas 21 at Thermopylae,

and Alexander 22 when he set out for the conquest of Asia. Hannibal was 30 at Cannae. Caesar was 42 when he began the conquest of Gaul, but Marius was past 60 when he struggled with Sulla for leadership in the war against Mithridates.¹

2. *The Middle Ages.* Theoderic the Great fought his great battles and founded his empire before he was 40. Genghis Khan crossed the Great Wall of China at 54, conquered Peking at 60, and kept on fighting successfully until just before his death at 72. At Poitiers the Black Prince was 26, and Jeanne d'Arc was 17 at Orléans. The fact that the latter was something of a military "miracle" and was burned at the stake at 19 (something which does not happen to "regular" generals) may detract from her value as an example. The average age of the "fighting" Kings and Emperors of Medieval Germany up to the 16th century was 48.

3. *Europe in the 17th Century.* Gustavus Adolphus' victorious career terminated when he was only 38. Wallenstein was 51 when murdered. Turenne became Marshal of France when 33 and was killed in battle at 64. Condé was scarcely 22 at Rocroi when he beat the Spanish, up to then the best infantry in Europe. Cromwell, who took up soldiering late in life, was 45 at Marston Moor and 52 at Worcester.

4. *Europe in the 18th Century.* At Blenheim, Prince Eugene was 41 and Marlborough 54. Charles XII of Sweden was only 18 at Narva where he won, 27 at Poltava where he lost, and 36 when he was killed. The Maréchal de Saxe took Prague when 45. Frederick the Great was 29 at Mollitz, the first battle of the three Silesian Wars, and 51 at the end of the Seven Years' War. Wolfe's successful career was terminated at Quebec at 33; Clive, the "military outsider," was 32 at Plassey.²

5. *The American Revolution.* Washington took over command at 43. The

generals under him (with the exception of Isaac Putnam, who was 58 in 1776 and soon retired) were decidedly young. Arnold was born in 1728; Steuben in 1730; Schuyler in 1733; Gates in 1741; and Greene, their Benjamin and probably the best general after Washington himself, in 1741. In Lafayette, born in 1757, the type, if type it was, of the youthful high-born military leader of Absolutism transferred itself to the American scene.

6. *The French Revolution, Napoleon, and the Wars of Liberation.* Bonaparte was 27 at Arcola and 46 at Waterloo. To mention a few marshals' ages at the time of the battle which is considered "their own": Moreau, though not properly speaking a marshal, was 37 at Hohenlinden; Lannes, 31 at Montebello and 40 when killed at Aspern; Ney, 36 at Ulm; Davout, 36 at Auerstedt when Brunswick was 71; Bernadotte, 46 at Wagram.

By the time the French Army was half way through its glorious career, the leadership of the *Grande Armée* was still young. In August 1805, at the eve of Austerlitz, the youngest of its 141 general officers was 29; the oldest was 58. Their average age was 41, and more than one-fourth of them were between 32 and 37. The average of the colonels at that time was a little under 39; that of the chiefs of battalions 39½; that of the captains nearly 39; the lieutenants, many of them privates under the *ancien régime*, were often older than the officers of higher rank.

To examine the age of Napoleon's marshals in still another way, the average age at the time that they were made marshals was 44. Leaving aside two marshals who were created for political rather than military reasons, the average age was only 42. The most important among them were usually also the youngest—Davout, Marmont, Ney, Bernadotte, Lannes, Soult, Suchet. The Napoleonic wars brought out for the first time the phenomenon of the wearing out of military leaders. Napoleon put an end to the leisurely kind of warfare of the 18th century with its custom of going into winter quarters; campaigns were fast and frequent, the occasions for resting few and not regarded with favor by the Emperor. He knew how to reward his marshals materially, but he did not know how to rest them. Several were definitely war-tired by 1812 or 1813, and there were a few mental crack-ups, such as that of Junot, who died insane, and Berthier, who committed suicide.

¹Marius possessed, as Plutarch writes, "an ill-timed ambition and madness for fame, which never grew old. Though now unwieldy in his person and obliged, on account of his age, to give up his share in the expeditions near home, he wanted the direction of foreign wars." Marius took up exercises with the Roman youth on the Field of Mars, a spectacle which moved some Romans to pity and others to derision.

²Aside from revolutionary periods high birth assisted generals in reaching important commands at a relatively early stage. The "born" youthful leader, however, was often assisted by an old aide. Schwerin, who was killed at Prague at the age of 73, won the battle of Mollwitz for the inexperienced Frederick.

AGE AND FIELD COMMAND

On the side of the powers allied against Napoleon, Wellington was 40 at Talavera and 46 at Waterloo; Scharnhorst was 52 when he began the Prussian army reform and 58 when killed in 1813. Gneisenau, Blücher's chief of staff, was 46 when starting on "the Reform" and 53 in 1813. Even the Austrians, who liked their leadership old except in desperate moments, had in Schwarzenberg, 42 in 1813, and Radetzky, his chief of staff at 37, one of the youngest leadership arrangements in their history, which in its worst periods abounds with old age.

7. The 19th Century. Down to 1861 there was a period of superannuation in military leadership. Raglan was 66 at the outbreak of the Crimean War; both he and St. Arnaud, who was 53, died of so-called nautical causes during the war. Wrangel was 80 in the Danish War of 1864; Radetzky 82 at Custoza and Novara; Winfield Scott, 75 at the outbreak of the American Civil War; Moltke, 66 in 1866. Without overlooking the military genius of Moltke, it should also be remembered that 1866 was a seven weeks' war and that the war of 1870-71, in which the Prussians enjoyed the advantages of planned initiative, was comparatively speaking, a "restful" war, being divided into convenient campaigns with plenty of time for recuperation and recreation. The Duke of Cambridge was able to function, or so it was thought by Victoria and many others, as commander in chief of the British army until he was 76.

Compared with most of the European wars of that time, the American Civil War was long-drawn, strenuous, and hard on the military leaders. In 1861 the ages of men who were or who became Union and Confederate commanders were as follows: Grant, 39; Sherman, 41; Hooker, 47; Sheridan, 30; Banks, 45; Buell, 43; Burnside, 37; Ferrero, 30; Franklin, 38; Hunter, 59; McDowell, 43; Meade, 46; Ord, 43; George H. Thomas, 45; Robert E. Lee, 54; "Stonewall" Jackson, 37; A. P. Hill, 36; D. H. Hill, 40; Early, 45; A. S. Johnston, 58; Joseph E. Johnston, 54; Longstreet, 40; Forrest, 40; Morgan, 36; Stuart, 28; Kirby-Smith, 37; Leonidas Polk, 55. At Appomattox, Lee was 58, Grant was 43, and Sherman was 45. In May 1865 the commanders of corps and divisions under Sherman were: Howard, 34; Logan, 39; Hazen, 34; Davis, 37; Slocum, 37; Mower, 37. By the end of the Civil War, the average age of corps and divisional commanders was not much above 30.³

8. The First World War 1914-1918. There was a tendency toward superannuation of military leadership after 1865 and 1871. Joffre was 62 in 1914, Moltke was 66, Kitchener was 64; among the later comers was Cadorna, 65 in 1915. The three leaders of the important right wing of the German army on the Western Front in 1914, Kluck, Bülow, and Hausen, were all 68. It was considered thorough "rejuvenation" when Falkenhayn became Moltke's successor in September 1914 at the age of 55. Elderly German generals such as Hindenburg, 67, were typically harnessed together with much younger chiefs of staff, such as Ludendorff, 49, Seeckt, 48, Hoffmann, 45, and Groener, 37. Much the same arrangement prevailed in France, where Joffre, Foch, Castelnau (all aged 63 in 1914), Pétain, Nivelle, and Sarrail (all 58) had chiefs of staff of the age-group

to which Debeney, 59, Weygand, 47, and Gamelin, 42, belonged.

By comparison, the generals of the B. E. F. were not over-age in 1914. Sir John French was nearly 62 at the beginning of the war, but his successor, Haig, was 53. The holders of the four top home commands in Britain (Haig, Grieson, Smith-Dorrien, and Plumer) averaged 55, which was none too low since Grierson collapsed and died before the outbreak of actual hostilities. General Sir Archibald J. Murray, chief of staff to the B. E. F., was 54 in 1914, but the strain of the retreat soon told on him. The average age in August 1914 of the eight generals who eventually became army commanders (Haig, Smith-Dorrien, Plumer, Allenby, Monro, Rawlinson, Gough, and Byng) was 52.

The generals of the A. E. F. in Europe and the Far East were in their fifties. Pershing was 57 in 1917; so was Leonard Wood, his competitor. The age of the American generals in the field varied from 58 in the case of Henry Allen to 51 in the case of Harbord. Theodore Roosevelt was 59 when his offer to go to France with a division was turned down by Wilson—not entirely for political reasons it seems, for Roosevelt died very early in 1919. Pershing's five chiefs of section were: Nolan, 46; Fiske, 46; W. C. Connor, 44; Fox Connor, 43; and Moseley, 43. Frank R. McCoy, 43; MacArthur, 38; Foulois, 38; and Marshall, 36, are examples of Pershing's desire for young commanders in field and staff positions.

Irregular military leadership in the First World War was on the whole young. Pilsudski was born in 1867, both Trotsky and Stalin in 1879, General Monash in 1865, Colonel Lawrence of Arabia in 1888, and Tukhachevski in 1894.

9. The Post-War Period, 1919-1939. After 1918 the chiefs of staff frequently took over command, and for a time generalship was young. Weygand, Debeney, Gamelin in France; Seeckt, Schleicher, Fritsch in Germany; Deverell, Gathorne-Hardy, and Ironside in England all provided relatively youthful leadership. Most nations provided for the compulsory retirement of generals and other ranks. This program ran counter to a tendency to make use as long as possible of general officers with war experience in high positions, preferably in important staff positions. Those governments whose military policies were looking back to the last war, rather than forward to the next, tended to retain generals of advancing years. In England in August 1937 the four first-class home commands were held by men fully seven years older on the average than in August 1914; at the same time the five commands of division were held by men averaging eleven months older than those of 1914. In the United States, the average age of major generals was 60 on November 11, 1936; that of brigadier-generals was 58½, with George C. Marshall as the youngest in age and rank. In England the retirement ages were drastically reduced in 1937 under the somewhat stormy secretaryship of Hore-Belisha, who laid down rules for retirement and actually applied them. Measures of a similar drastic character were not undertaken in the United States until September 4, 1941. At that time the age limits for various ranks were set as follows: major generals, 62; brigadier generals, 60; colonels, 55; lieutenant colonels, 52; majors, 47; captains, 42; first lieutenants, 35; second

lieutenants, 30. The motive for the reduction was officially given as "purely a matter of vigor."

The French army in particular suffered from superannuation. At the beginning of the Second World War, Gamelin was 67 and Weygand was 72. The *Conseil Supérieur de Guerre* was composed exclusively of *Généraux d'Armée* who no longer held field commands. They were practically on the retired list, but after the outbreak of war, they received command of armies and army-groups. Their average age in every case was very high. Without taking any responsibility for the absolute exactness of the following figures, the limits appear to have been: *général de brigade*, 59; *général de division*, 62; *général d'armée et membre du Conseil Supérieur de Guerre*, 65. Most of the *Conseil* were kept on active duty through enactment of special laws. Gamelin, Georges, Giraud, Huntziger, Requin, Corap, and Besson were all at least 63. Blanchard, Billote, and Bourret were not under 60.

That France was reluctant to lower substantially the age limits of higher officers even after the collapse of 1940 is revealed in the legislation which followed the defeat. The retirement age of army commanders was set at 62, corps or divisional commanders at 60, brigadier generals at 58, colonels at 56, lieutenant colonels at 54, majors at 52, and junior officers at 45. The same general age level was maintained in naval commands. Higher commands in the air force retired six years younger on the average.⁴

The prominent generals of the *Wehrmacht* in 1939 were von Bock, 59; von Brauchitsch, 58; Keitel, 57; and von Reichenau, 55.⁵ All of them were ten to fifteen years younger than Hindenburg in 1914 but slightly older than Ludendorff. The *Wehrmacht* has not been pedantic about retirement ages; if it is thought that a general is still young enough in his sixties, he is retained in the service. Rundstedt is now 65 and Leeb is 67. Technicians like Guderian and Sperrle were 49 in 1939; Goering was 46.

There is little available information about the distribution of age groups among corps, divisional, and army commanders in the Red Army, but it would seem important to emphasize the fact that its rejuvenation is not one of age-groups so much as one that draws on all the strata of a newly organized society. In some respects the "purges" achieved a rejuvenation in the Red armies, at the head of which stand men still remote from ripe old age—Voroshilov, 61; Timoshenko, 47; and Zhukov, 48.

Though little exact information is at hand regarding the age of Japanese military leaders, the *seniores priores* principle—in fact, the whole *Genro* system—survived in military affairs as in other branches of government until the death of Prince Yamagata in February 1924 at over 80 years of age. Up to that time reforms long overdue had to wait, since younger army officers did not "wish to do anything likely to injure the feelings of those to whom they owed a debt of gratitude." In due time, the hideous "youth movement" in the Japanese army arose with its program of assassinating civilian elders at home and invading

³*La France Militaire*, August 7, 1940.

⁴The case of Reichenau is a peculiar one. He is said to have swum across the Vistula during the Polish campaign and to have carried his concept of the "strenuous life" to the point of an early death by apoplectic stroke in January 1942.

⁵Malcolm D. Kennedy, *Military Side of Japanese Life* (Boston, 1924), p. 109.

³B. H. Liddell, Hart, *Defense of Britain* (New York, 1939), p. 351.

MILITARY REVIEW

foreign lands for the purposes of "co-prosperity." It was led by such active proponents of the "new order" in the East as General Yamashita, the conqueror of Singapore, born in 1885.

Though no definite conclusions can be drawn at this stage of the present war about the ability of certain age groups of commanders to endure the strain of modern warfare, certain interesting observations can be made. Defeat condemned the French high-age hierarchy. The British have undertaken several revivals during the past year. Auchinleck, 54, was placed in command of the Middle East on July 1, 1941; Ritchie, 44, was made commander of the 8th Army; Brooke, 58, became chief of the Imperial General Staff on December 25 with Nye, 45, as vice-chief. Reverses in the field have frequently been followed by transfers involving the appointment of younger commanders. For example, Air Marshal Brooke-Popham, 63, was replaced by Pownall, 54; McLeod, 56, was replaced in Burma by Hutton, 51. The

victorious Germans made no important changes in command until December 1941. Not only has military victory favored the German officer, he has also been favored by the installment character of the war—two months of Poland in 1939; two months of Norway in 1940; three to four months in the Netherlands and France. Thus, there was always the possibility of rest between campaigns for even the military leader of fairly low rank. Only after prolonged campaigns in North Africa and in Russia has there appeared anything resembling fatigue or over-fatigue and tension. There are clear symptoms of it in the shifts which Hitler dramatically and "pathologically" announced in December 1941.

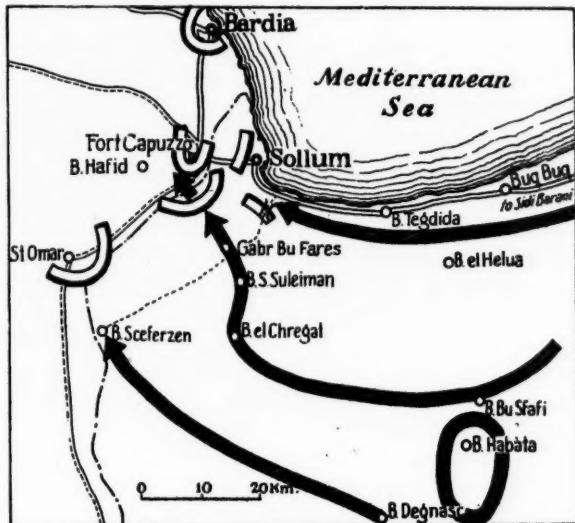
These observations raise the question of whether or not modern conditions of warfare make it imperative to rest or retire a successful general, either because victory has used him up, or because he should be spared for a later campaign. This would give him an opportunity to rest, to think, to prepare

himself for a likely new theater of war. The case of General Wavell's transfer to India at the age of 58 on July 1, 1941, may be an unintentional example in point. Such retirement should carry no derogatory implications even though the general public may not at once understand the honorable and thoroughly rational motives of the act. The public should be made aware of the strain imposed on army commanders by modern war methods. The thorough-going Germans lay special emphasis on the problem of fatigue of the high command. Rules have elaborated to show commanders and medical officers how weariness can be avoided. Ludendorff's nervous breakdown in 1918 was due to overstrain and fatigue, while Foch's successes in 1918 were at least partly due to a rest of eighteen months during a period of temporary retirement. Modern war makes tremendous demands on the mental "elasticity" of commanders, and diminishing elasticity is closely linked to advancing age.

If a free government cannot organize and maintain armies and navies which can and will fight as well as those of an autocracy or a despotism, it will not survive.

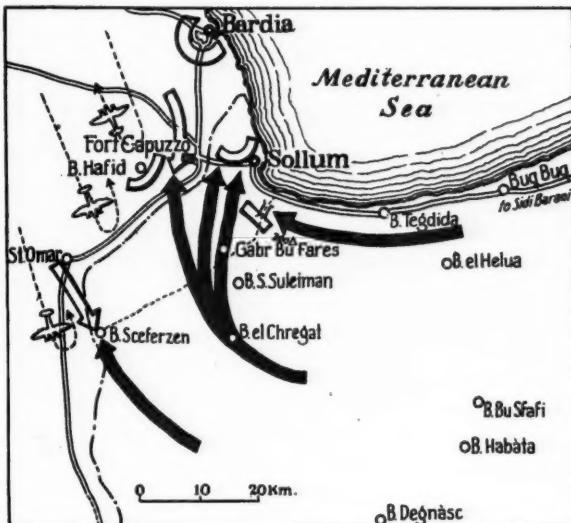
—Theodore Roosevelt.

A German Version of the Battle of Sollum



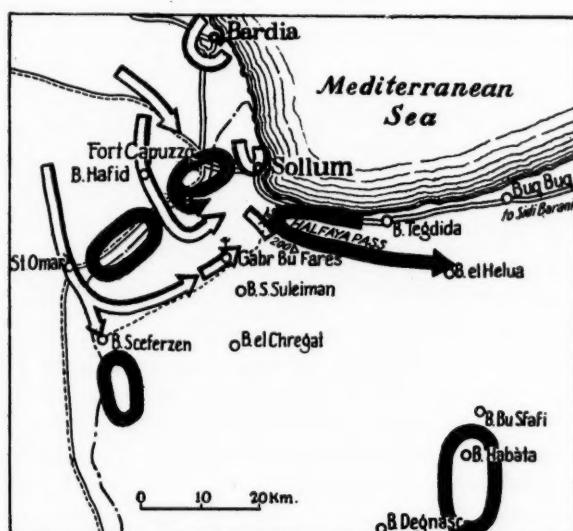
I. THE BRITISH ATTACK BEGINS

After several days' march, the British tank formations, including the new 32-ton tank of the *Mark II* type which is covered with eight centimeters (3.15 inch) steel plating as far down as the caterpillar tracks, took up their positions. The three storming wedges (black) are directed against the Halfaya Pass which commands the road to Sollum, against Fort Capuzzo which lies before Bardia, and against Sidi Omar, the right flank of the German-Italian front in North Africa. The three attacking groups are aiming for the German-Italian positions (white) and in relieving the British troops shut in at Tobruk.



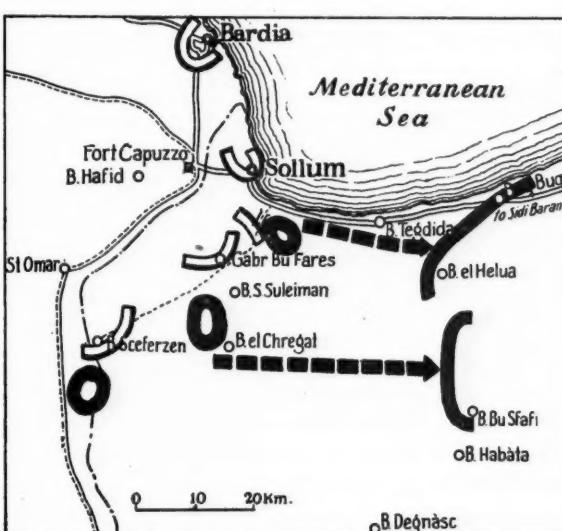
II. GERMAN RESISTANCE AT HALFYA PASS HELPS DECIDE THE BATTLE.

A German infantry battalion stubbornly defends the Halfaya Pass against the British tank and infantry units which try to storm it. The British reinforcements which are waiting on the coast road cannot proceed. The British tanks in the middle group succeed in pushing forward as far as Fort Capuzzo, but the supplies expected by way of Sollum do not arrive. The necessary petrol and a certain amount of ammunition are procured with the utmost difficulty.



III. GENERAL ROMMEL'S FLANKING MANEUVER SEALS BRITISH DEFEAT.

In a bold counter-attack the German tanks break through the British line between Sidi Omar, Fort Capuzzo and Sollum. They threaten to cut off the British from their base. General Wavell recognizes the threat in time and gives the order to retreat. This move resulted in the loss of the greater part of his tanks.



IV. BACK TO ORIGINAL POSITIONS.

The British attack on the triangle Bardia—Sollum—Capuzzo, during which the middle group scored a temporary victory, had completely collapsed. The German Africa Corps is the victor in this engagement in the desert. After the battle it was able to advance still farther towards Egypt.

—From *Signal*

Artillery-Infantry Cooperation

BY
COLONEL CHARLES A. PYLE, *Field Artillery*,
Instructor, Command and General Staff School.

Although the subject of this article is artillery-infantry cooperation, we will cover also several points on the coordination of artillery support with infantry effort. We may have to go into artillery technique to a limited extent in order to clarify some important phases.

Let us begin our discussion by emulating the old Grecian classical philosophers and carefully define the terms we are going to use.

Question: What is cooperation?

Answer: Cooperation is the working together of several *independent* elements to a common end.

Question: What is coordination?

Answer: Coordination is the *control* of several elements to achieve a desired result. When you attempt to hit a golf ball your arms, wrists, eyes, legs, etc., all do certain things. Their operations are directed and coordinated by your brain—at least sometimes. In a military operation the commander controls and coordinates the actions of his various subordinate units—his infantry, artillery, air force, etc.,—to a common end. The infantry attains its success through fire, movement and shock action. The artillery, through its fire—its power of destruction and neutralization—assists the *movement* of the infantry. The engineers, through construction and repair, facilitate the movement of the entire force and through demolitions and obstructions hinder the movement of the enemy. The signal corps, chemical service, air force, etc., each have a part to play—a mission to perform. The commander coordinates the action of all these subordinate units to the end that the force as a whole develops its maximum power.

Question: How may the division artillery be assigned or organized for combat?

Answer: Artillery may be either:

- (1) in direct support
- (2) in general support
- (3) attached to a subordinate element.

Question: What is meant by direct support?

Answer: Artillery in direct support has the primary mission of furnishing artillery fires in close support of a given subordinate infantry element of the division. Since it is retained under the control of the division artillery officer it must also be prepared to fire on division order outside the zone of action of the supported unit. In turn it may request reinforcement of its fire. For example, a battalion of field artillery may be in direct support of a regiment of infantry.

Question: What is meant by general support?

Answer: Artillery in general support has the mission of supporting the entire division. Medium artillery is almost always used in general support. Light battalions *may* be in general support. Artillery is not held in reserve. In case an infantry regiment is held in reserve, the light artillery battalion which could normally be in direct support of that regiment is placed in position in general support of the division until the reserve infantry regiment is committed. Artillery units in general support may be given the mission of reinforcing the fires of one or more of the artillery battalions which are in direct support.

Question: What is attached artillery?

Answer: Attached artillery is that artillery which is *detached* from the control of its normal commander and *attached* to another unit. Units of the corps artillery may be attached to the division artillery. Units of the division artillery may be detached from the control of the division artillery officer and attached or placed under the control of an infantry regiment.

Question: Does the division artillery officer cooperate with the division commander in the use of the division artillery?

Answer: Yes, of course, but this is the cooperation which any subordinate gives his superior in carrying out the orders of the superior. The division commander *directs* the use of the artillery to the end that the artillery does its part in carrying out the division mission. This is coordination and is a function of command. In the same way the commander of an artillery unit *attached* to an infantry unit is directed by the combat team commander as to how the artillery will be employed: that is, the force commander coordinates the employment of the artillery, with the other arms.

Question: Where then does the infantry-artillery cooperation come into the picture?

Answer: It comes in when subordinate infantry commanders and subordinate artillery commanders, neither under the direct control of the other, nevertheless work closely together to carry out the common mission. The commander of an artillery battalion in direct support of an infantry regiment does not receive *instructions* from the supported infantry commander. The two commanders work closely together, however, to the end that the artillery does everything possible to further the infantry effort.

Question: How is this cooperation obtained?

ARTILLERY-INFANTRY COOPERATION

Answer: Infantry-artillery cooperation is obtained:

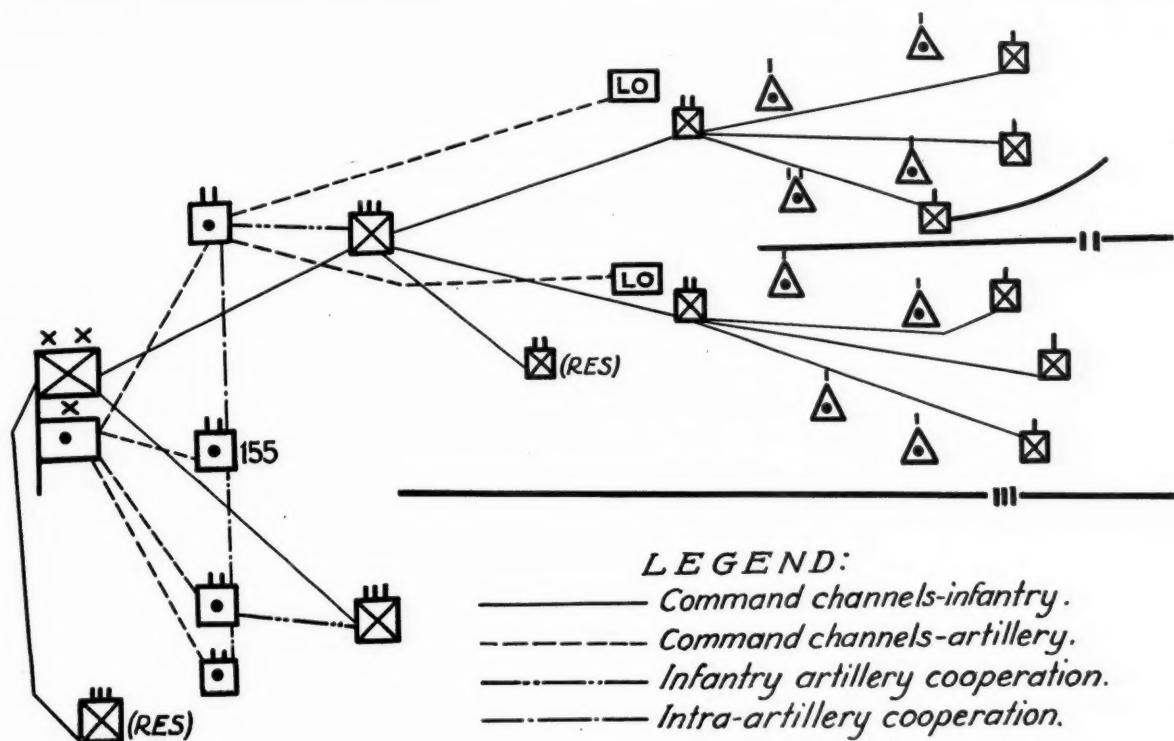
(1) By building up in the minds of both the infantry and artillery a *desire* to cooperate.

(2) By insuring a close *liaison* between the two branches to the end that the desire may be fulfilled.

The spirit of cooperation—the desire to cooperate—is insured when each branch understands the capabilities and limitations of the other—when commanders know each other—when a feeling of comradeship and interdependence exists between the two. This state of mind is gained through training. It is begun at Fort Sill and Fort Benning

mystery. It spread the feeling that a brilliant mind and a college education in higher mathematics was necessary to grasp the involved technique of artillery fire. Fortunately this attitude has changed. Now everyone knows and the artillery admits that anyone who can add two and two and get an approximately correct result has at least the mental equipment to be a Field Artilleryman.

But it is not enough that the commanders of artillery and infantry units have a desire to cooperate. No matter how great the desire, the two branches cannot work together if each remains ignorant of what the other is doing. It is essential that the two arms maintain a close liaison in order



where each school gives a course in the tactics and technique of the other. It is furthered at this school where officers of infantry and artillery, as well as all other branches, become widely acquainted with each other and work together at a common task. It is furthered where artillery units and infantry units live together at the same post and train together. It is furthered by social contacts between the officers of the two branches. It is strengthened by a study of military history including recent battles which bring out forcibly that in cases where the two worked together in actual combat success was made easier and where the two failed to cooperate defeat was made more probable.

The will to cooperate is weakened when either branch isolates itself from contact with the other, isolation—physical or mental. Prior to World War I, the field artillery tended to surround itself with

that the desire to cooperate may be followed by a real intelligent cooperation. This liaison—this linking together—may be gained in several ways.

First, the two commanders should maintain the closest possible contact. Often the command posts of the two will be close together. This is not always practicable. The command post of the artillery commander should be where he can best control his subordinate artillery units. That will usually be somewhere near the battery positions. If the commander of the supporting artillery cannot remain with the commander of the supported unit he keeps a liaison officer with the supported commander. Also by frequent personal visits he assures himself of still closer liaison with the infantry commander. The German army recognizes this necessity of keeping the two command posts close together and also having the artillery commander close to his units. They

prescribe, in some cases, that the infantry commander conform to the location of the artillery command post.

Let us sketch the units in an infantry triangular division and see how this thing works.

(1) Division command post and division artillery command post in the same location.

(2) Two infantry regiments in line with one in reserve with command channels to division command post.

(3) Two light artillery battalions in direct support with command channels to division artillery commander.

(4) One light battalion and one medium battalion in general support with command channel to division commander.

(5) Bring out channels of cooperation between direct support battalions and infantry regiments in line and between direct support battalions and general support battalions.

But is this command liaison between artillery battalions and infantry regiments enough? Is it sufficient for the artillery battalion commander to know the situation only as well as it is known to the infantry regimental commander? The answer of course is "No." The infantry fights and maneuvers by battalions. Artillery fire must support the maneuver of battalions. The artillery battalion commander must keep informed as to where infantry battalion commanders want fire support. To have requests for fires go from infantry battalion commanders to infantry regimental commanders and then to the artillery battalion commander would take too much time. A much closer union is achieved by having artillery battalions maintain liaison officers with front line battalions. In this way artillery battalion commanders can keep in constant touch with the situation existing on the front of each infantry battalion which they are supporting. Infantry battalion commanders request supporting fires directly to the artillery through these liaison officers.

Each light artillery battalion has two liaison sections. Each consists of an officer and a group of seven trained enlisted men. Each section has radio and wire equipment. Note that whereas the artillery battalion has two liaison sections the infantry regiment has three battalions. At the critical stage in the action all three infantry battalions will probably be committed. In this case the artillery battalion commander must improvise a third liaison section from the other two or from members of his staff. In the *opinion* of many FA officers this is a weakness in organization. This system of improvising works well on paper. It doesn't work so well in the field even on maneuvers. In my *opinion* three liaison sections should be provided and they should train with and live with the supported infantry battalion a large part of the time. They should get to feel that they are as much a part of the infantry as of the artillery.

The liaison officer must

(1) Be tactful; (he must get along with tired, overworked infantry staff officers and commanders).

(2) Be thoroughly familiar with the capabilities of his battalion; (he will have to answer questions about them).

(3) Be thoroughly familiar with the plan of action of the artillery; (otherwise he will be caught out on a limb).

(4) Understand infantry tactics, organization and plan of action; (if he doesn't he will be in a fog most of the time).

(5) Be self-reliant and resourceful.

The duties of the liaison officer are:

(1) Primarily, adviser of the infantry commander on artillery matters and representative of the artillery commander;

(2) He may act as observer for the adjustment of fire;

(3) He furnishes the infantry commander information concerning where, when and how much artillery support can be given;

(4) Informs the infantry commander promptly of any changes in the artillery plan;

(5) He transmits to the artillery commander—

(a) The requests for fire,

(b) Keeps him informed at all times of the plan of action of the infantry, the location of the forward elements of the supported units and enemy front line,

(c) Information on possible battery positions, observation posts and routes of advance.

The liaison officer maintains constant contact with the infantry commander.

It is evident that the liaison officer has an important mission. He must be experienced. He is a vital cog in insuring infantry-artillery cooperation.

Question: Is this enough? Is it enough that the artillery battalion commander keep abreast of the situation as known at the infantry battalion command post?

Answer: No, it is not enough. The infantry battalion fights with companies. The infantry battalion commander is kept informed of the situation existing at the front by observation or runners or radio. If a company is held up by resistance which requires artillery fire, the company commander can dispatch a runner to the battalion command post requesting such fire. When and sometimes if the runner arrives the infantry battalion commander can call for the necessary support through the liaison officer. But this is slow and targets are difficult to designate by runner. The only answer to this situation is forward artillery observers—observers who are up in the sector or zone of front line companies. The artillery battalion organizes a system of observation posts covering the section of the supported

ARTILLERY-INFANTRY COOPERATION

unit. Some of these observation posts, usually at least one per battery, are well forward where the observer can see the situation and can deliver observed fires on the desired targets. Do not get the idea that each front-line infantry company has an artillery observer—possibly they should but there aren't enough observers. These artillery observers—perhaps I should call them artillery adjusters—are not liaison officers—although they do maintain contact with infantry units in their vicinity. They do not stay with infantry company commanders—they go where they can best observe the sector.

Now it is evident that many calls will be received for fire support. The better the communication system works the more calls will be received. All of them cannot be answered. The artillery battalion is the usual fire unit. Battalion concentrations are the rule. One unit of fire will provide only thirty-five or forty battalion concentrations.

Question: Who decides which calls will be answered?

Answer: In the case of an artillery battalion supporting an infantry regiment, the *decision* is made by the artillery battalion commander. But while this is thoroughly true, do not get the idea that the artillery battalion commander is free to shoot whenever he likes. He is *required* to comply with the requests of the supported infantry regimental commander subject only to orders of the division artillery officer. The infantry regimental commander works out the scheme of maneuver of his regiment and, in conjunction with the artillery battalion commander, the general plan of artillery fires to support that maneuver. Usually the infantry regimental commander coordinates the artillery fire with infantry maneuver by designating which infantry battalions are to receive priority in artillery support. The infantry battalion commanders and artillery liaison officers work out the artillery plan of fires to support the maneuver of the infantry battalions. But as the attack progresses the plan of infantry maneuver may change. The infantry regimental commander may want to shift priority from one of his battalions to the other due to a changing situation. It is essential that the artillery commander be kept informed of

these changes in plans if the artillery fire is to be coordinated with infantry effort. He must know at all times when the infantry commanders want the fire—where the critical action is taking place. In no other way can he know which calls for fire he should answer among the many calls he will receive from his observers. Therefore, he maintains continuous command liaison with the infantry regimental commander.

The technique of artillery fire is such that any observer in the battalion should be able to adjust the fire of all batteries in that battalion on a given target in four or five minutes. Also any observer in any of the artillery battalions in the division can adjust the fire of all four battalions on any target. The division commander has therefore a powerful and flexible weapon in his artillery with which to influence the action on any part of the division front. But note that when the division commander concentrates the fire of the division artillery on one front he is taking away the direct support artillery of one or more of his infantry regiments on some other front—taking away artillery support which they may vitally need. In every case this is a command decision of the division commander.

This, then, is the picture of how close cooperation is obtained where artillery is under centralized control. What happens when operations are decentralized to combat team commanders? It takes time to install the necessary communications from the division command post to artillery battalion command posts. How is cooperation obtained while these communications are being put in or in those situations where the situation is so mobile that such communications cannot be maintained? It has been said that light battalions will be attached eighty or ninety percent of the time—in bivouac, on the march, during the development—all the time except when a coordinated attack is about to be launched. In this case, the artillery battalions are *attached* to infantry regiments and instead of cooperation between the infantry regimental commander and the artillery battalion commander we have the combat team commander (artilleryman or infantryman) coordinating the action as a command function. Everything else remains the same.

Artillery is the God of War.

—Joseph Stalin.

Make the Most of Your Prisoners

By
MAJOR BYRON L. PAIGE, *Coast Artillery Corps*,
Instructor, Command and General Staff School.

Every prisoner is a potential source of valuable information—information which may spell the difference between the success or failure of projected operations. Major Sanford Griffith, of the G-2 Section of the First Army in France during World War I, stated that of the enemy information actually used in the planning and conduct of operations at least 75 percent came from prisoners and captured documents. Estimates of other staff officers ran even higher. The actual figures are not important, since they may be modified by circumstances and by changes in the technique of war, but they do serve to emphasize the importance which not only G-2's but the commanders themselves must attach to the proper exploitation of such prisoners as may be available.

Experience in the first World War, and it has been verified beyond question in this present conflict, indicated that the value of prisoners as a source of information *varied according to certain controllable factors*.

For instance, it was found that the first German prisoners delivered to American enclosures in France were surly and disrespectful and would not respond favorably to questioning. Their attitude was traced to their disdain for the poor discipline which obtained among the guards and the lack of military courtesy between ranks. As a consequence, their well-established habits of obedience and respect for officers had quickly been undermined, and their resistance to questioning correspondingly increased. When the condition was corrected there was a noticeable change in attitude. A smartly run, well disciplined enclosure, by sustaining the prisoners' respect for authority, made the job of the interrogator 100 percent easier and resulted in the development of information which might otherwise never have come to light.

Another factor which can be controlled to a large degree is the prisoner's psychological state. Experience has proved beyond question that prisoners are more likely to give valuable information while they are still suffering from the strain of battle and the shock of capture. Capture by the enemy, to the ordinary individual, is a personal catastrophe which so far transcends in importance all other considerations of training and duty and memorized rules that for the moment these are usually forgotten. Add to this the nervous strain resulting from recent participation in battle, which tends to lessen the prisoner's

control over his reactions, and you have the ideal psychological state for exploitation by an interrogator.

This mental strain continues until the battle strain wears off and the prisoner begins to adapt himself to his new status. As soon as he begins to form a fairly definite picture of his personal fate he will begin to take stock of what has happened. If he has not already been successfully questioned, the chances are he will not respond to questioning from this point on. On the other hand, if he realizes that he has already committed himself by talking it is possible that he will continue to answer questions freely. Even if he attempts to cover up, the information already developed will greatly facilitate subsequent questioning. Thus it becomes of utmost importance that each prisoner be examined as soon after capture as possible and favorable responses established.

To the same end it is important that the nervous tension of the prisoner be maintained by every legitimate means until his psychological state can be exploited by trained interrogators. Prisoners should be kept segregated—officers from enlisted men, NCO's from privates—and all communication should be prohibited or at least restricted until after the initial interrogation. They should be told nothing as to where they are going or what is to happen to them. They should not be given food or cigarettes prior to the examination unless for some reason it is unduly delayed. They should be kept in doubt and on the move. Insubordination or disrespectful conduct toward officers should be firmly dealt with.

The British are emphatic on the point that interrogation should be done only by specially trained and qualified officers. All interrogation in the British Army is done by officers of the British Intelligence Corps who have specialized in languages and interrogation procedure. As in trout fishing, the artful manipulation of the fly, or question, gets a rise out of the trout, or prisoner, while a bungling effort may make him wary and suspicious. After this, even a clever angler will have trouble enticing our trout out into the open.

The British say that they have definitely proved that a bungling attempt to question a prisoner will in most cases ruin what might otherwise have been a potentially rich source of information. Such attempts by unqualified interrogators or by unauthorized personnel are a factor which can and should be under control.

MAKE THE MOST OF YOUR PRISONERS

This still leaves us with the problem of the interrogation (by a *trained interrogator*) after the prisoner has been delivered, still shaking from the strain of battle and dazed by the shock of capture, by an escort which upheld our highest standards of military discipline. The success of the interrogation is not automatically insured. There are still factors which can be controlled to some extent and which will affect the results of the interrogation.

For instance, the physical arrangement of the examination room is a controllable factor. A room without distracting features; a good map of the area available for orientation of the prisoner; a concealed position for a stenographer or recorder; the arrangements of lighting to fall on the prisoner's face; facilities for segregation of those awaiting examination from those already examined—all of these things will facilitate the examination.

And, of course, the more the interrogator knows about the background of the particular prisoner the more likely he is to get results quickly. It is therefore important that records accompany the prisoner stating the unit making the capture, the time, the place, and the circumstances. Documents found on the prisoner (or a description of any forwarded by special messenger) should accompany him for study by the interrogator, as should a summary of information developed by routine questions of lower echelons.

The interrogator must be able to talk the prisoner's language—figuratively as well as literally. He must know military slang, he must know the enemy's organization and the duties of individuals; he must be able to speak familiarly about matters in which the prisoner's personal interests are centered. To this end he must study letters, diaries, newspapers—picking up scraps of information or even gossip which he can turn to account.

From here on we are dealing with intangibles which will vary according to the prisoners and which must be carefully weighed and considered by the interrogator in planning his approach to the interrogation. However, there are certain fundamental principles which apply to most prisoners.

Perhaps you have been one of a group which underwent a period of nervous strain. Perhaps, for instance, you were in a car that narrowly averted a serious accident. If so, you can doubtless remember that after the few moments of nerve-wracking suspense, when the danger was past, everyone gabbled excitedly like a lot of geese. The point is that volubility, a desire to talk, accompanies a release from nervous tension. What is actually said is of no importance to the speaker. Exercise of the speech function is in itself a source of release and is an involuntary reaction which accompanies the cessation of strain. A clever interrogator will often utilize this

reaction by allowing a prisoner to ease up momentarily with a cigarette or a cup of coffee and leading him into apparently casual conversation, during the course of which carefully phrased questions may elicit important information. The average prisoner does not wish to antagonize his captors. It is natural for him to respond to questioning which has no apparent military significance, and remember that the average enlisted man has little conception of how important small details can be in piecing together a complete picture. Experience has shown that most prisoners—and this includes the Japs as well—will talk if the questioning is not too pointedly a search for major tactical information.

As a matter of fact, a trained interrogator will often give a prisoner a chance to salve his conscience by laying stress on an unimportant question that the prisoner, in refusing to answer it, feels that he is fulfilling his obligations completely. The desired information may then be developed by more subtly phrased questions asked in a perfunctory or casual manner.

It is readily apparent that a great deal depends on the skill and knowledge of the interrogator, whose bag will contain many more tricks than are outlined above. But every individual in the lower echelons must be taught the importance of prisoners and documents in the conduct of our operations and must know how he can best cooperate with our efforts to exploit prisoners as a source of information. For the private this may consist solely of forwarding documents promptly, or performing duties as an escort or prisoner guard in a military manner. For the commanders of smaller units it means a strict limitation on questioning, confining it entirely to routine personal questions and identifications where no specially trained interrogator is available—and “specially trained” implies much more than language qualifications. It means supervision of escort discipline and the setting up of adequate machinery to search and process prisoners quickly, filling out the necessary initial forms. And above all, for the subordinate unit commander it means an extra effort to expedite the delivery of prisoners to the next higher echelon, even to the point of diverting much-needed transportation for this purpose.

Unfortunately, our peace-time training failed to emphasize the importance of prisoners. It was difficult to make a realistic play of prisoners in maneuvers. As a result, we are sadly lacking in appreciation of the important role which interrogation of prisoners is playing and will continue to play in this war.

Actually, it is so vital a role that the success or failure of future operations may ultimately hinge on whether or not you are able to “make the most of your prisoners.” It is worth your study, now.

Liaison Officers

(A RUSSIAN VIEWPOINT)

The direction of an operation of any dimensions is unthinkable without a live, direct liaison not only from the higher to the lower commander, but also upward, from the lower units to their higher commander. The telephone, telegraph, radio, flash or sound signal and other technical means of liaison, regardless of their dependability, are frequently unable to fully satisfy the commander engaged in the direction of combat. Some times the situation is such that only the personal intervention of the commander or a responsible officer empowered by him, will help a unit in the proper solution of a combat problem.

The complicated organization of cooperation of the various arms, need for the secrecy of direction, and finally, the great variety of questions which must be explained to units when assigning missions to them, make the services of liaison officers absolutely indispensable. With their help the commander can organize not only direct contact with his lower units, neighboring units and with the higher headquarters, but he can also realize the actual, dynamic control of his forces during the progress of an operation.

The liaison officer is not merely a "responsible messenger" charged with the delivery, within a certain time and to a certain place, of a battle order, instruction or report. The liaison officer is the commander's proxy, possessing a broad operative and tactical view, capable of interpreting the combat order properly and with precision, of solving questions arising in the front lines, of helping lower units and of executing the commander's desires with effect on the progress of combat.

The scope of the liaison officer's activity includes not only the faultless maintenance of a working map, the ability to compose concise, clear reports with speed and to conduct various types of negotiation with the aid of the several signal agencies by code or cipher. This is not enough. The liaison officer should be able to adjust himself to any terrain, time and situation and simultaneously to keep his immediate superior or the commander to whom he was sent clearly oriented.

The combat activity of the liaison officer is varied. Yesterday he was delivering an emergency order, today it is his task to observe the progress of an operation, tomorrow he may be dispatched beyond the front lines to our mo-

bile forces engaged in raiding behind the enemy rear or to guerrilla units.

By day or night, under all conditions of weather or in any combat situation the liaison officer must execute his mission with precision and within the prescribed time. Today he crawls on his stomach under enemy fire to a command post or to a front line unit, tomorrow he gallops on a horse, rides a motorcycle or drives a car, or flies in a liaison plane. He should be able to drive various vehicles, possess certain skills of the art of aerial navigation, be accomplished in firing weapons of many kinds, from the pistol to and including the machine gun. He needs to have these skills because any day he may meet with various surprises.

Combat experience abounds in scores of examples which show that the resourcefulness, initiative and the efficiency of liaison officers have helped them to extricate themselves from the most difficult situations and to perform their missions with effect. Major Yepanchin, a liaison officer, was once sent in a plane to the front line and while landing near a certain village, was fired upon by German automatic weapons. The effort to take off the ground failed because of damage to the plane motor. Yapanchin was surrounded by the enemy on three sides. However, this liaison officer, using the plane's machine gun, killed some of the Germans, pinned others to the ground and cleared a path for himself by using hand grenades. The valuable information which he delivered helped the headquarters in solving the enemy's intentions and in counteracting them. In another case a liaison officer, Senior Lieutenant Zhemchuzhnikov, acted boldly and with initiative, made his way through the front line to one of our units which had wedged itself deep in the enemy position, clarified the situation of that unit with regard to the front line, kept the commander informed of the general situation and brought back with him reconnaissance information of the greatest importance.

There are many such examples. Along with great bravery, persistence and skill the liaison officer must possess still another quality. We speak here of his ability to estimate the situation correctly—to possess a "commander's eye." Nothing should escape the liaison officer's inquisitive, observing look. Having properly evaluated the facts as he observed them he should make a report to both

his own commander and the commander of the unit to which he was sent. While being present at a headquarters' OP, or with the engaged units, the liaison officer must diligently observe all the actions of the enemy and be able to quickly distinguish between those of principal and secondary nature.

Knowing the general mission, decision and further plan of action, the commander's liaison officer is present during the development of the plan of battle and at the time when orders are issued by those commanders to whom he was delegated by his headquarters. This places a special responsibility on the liaison officer. If the combat order is not properly understood, if mistakes creep into the instructions issued by lower commanders, he may not ever remain as a disinterested spectator. It is his duty to inform his commander fully and with all truth on the situation as it actually exists, and make timely report of the mistakes made in decisions. This will enable the commander to take speedy action to rectify his subordinate's errors in order to prevent the disruption of the general plan of action.

The liaison officer is a welcome person in lower units and in headquarters of the neighboring or cooperating unit. His arrival there is awaited, for he brings new information on the situation, the enemy, action of own units. It is clear, therefore, that the liaison officer may not be a person who narrowly limits his duties. He should possess a good knowledge of the nature and tactical employment of all arms. This, for example, enables him, when necessary, to give advice to the commander of a force of all arms, or to an artillery commander, to suggest the proper solution and to render full aid in the execution of the order from higher headquarters.

The liaison officer is the eyes and ears of his superior. He aids the latter in the direction of his forces during combat, in taking timely measures during changing situations, in solving the intentions of the enemy and in working towards the success of the operation at hand. These responsible duties liaison officers should perform with all the zeal and perseverance characteristic of Soviet commanders. Especially now, when the Red Army is engaged in offensive operations against the German occupants, is their role important, as the direction of combat requires the extreme in flexibility and precision to insure their success.

—From *Krasnaya Zvezda*

The "WAACS" Are Here

By
MAJOR WALTER R. KREINHEDER, *Coast Artillery Corps*,
Instructor, Command and General Staff School.

The Nation's interest in the part women would play in our Army or military effort was initially crystallized into action through the establishment of the Women's Army Auxiliary Corps by executive order on May 15th, 1942, pursuant to appropriate federal legislation. This action by the 77th Congress authorizes a total strength of 150,000 WAAC Officers and Auxiliaries.

The translation of this national will into a vehicle of realistic proportions by the Congress and the President was not a gesture of flattery to feminine vanity nor glorification of American womanhood by service in uniform but, rather, was born of the definite requirement to conserve the national manpower for the war effort and an honest desire to permit direct participation by the women of the Nation.

The status of the WAAC, the scope of its activities and application, and the resultant effect on Army personnel and establishments is the purpose of this discussion.

The WAAC is organized for non-combatant service with the Army of the United States for the purpose of making available for combat or field, officers and men of the Army whose duties can be performed by women. This Act provides that the WAAC "shall not be a part of the Army, but it shall be the only women's organization authorized to serve with the Army, exclusive of the Army Nurse Corps." However, members of the WAAC are subject to military law pursuant to the 2nd Article of War when applicable. Regulations for the WAAC have been promulgated and issued by the War Department covering all phases of operations, uniforms, procedure, discipline, punishment, etc., etc.

The Women's Army Auxiliary Corps Training Center was established at Fort Des Moines, Iowa, pursuant to letter, Office of The Adjutant General, 9 July, 1942, and activated as of 1 June, 1942. The training center is under command of and operated by officers of the Army. Training Regiments for Officer Candidates, Specialists and Basics have been organized, and training methods and schedules, similar to those employed in corresponding army installations, are used.

A candidate for WAAC Officers' Training School must be a woman citizen of the United States between her 21st and 50th birthdays. She must be of excellent character, furnish proof of graduation from high school or its educational equivalent and pass an intelligence test the standard of which is comparable to that required for an officer of the Army of the

United States. She must submit satisfactory proof of birth date and citizenship, qualify according to prescribed height and weight chart and be physically fit.

The qualifications of the auxiliaries are similar to those shown above for Officer Candidates except for the educational requirement. However, these auxiliaries, whose status is comparable to enlisted men in the Army, must also pass an intelligence test. Women having civil service status will not lose any rights or seniority rating by reason of service with the WAAC. Married women are eligible provided any dependents are properly provided for.

Service with the WAAC will be by assignment for duty to units of the Army stationed either at home or abroad. The Commanding Officer of the Army unit to whom WAAC personnel is assigned for work tasks has supervisory authority as they would with civilian employees generally, but has no disciplinary authority. In matters of discipline the Army officer shall refer such matters to the WAAC unit commander for action.

The WAAC units are organized similarly to those of the Army. They are made up of separate companies, consisting of one hundred fifty WAAC officers and auxiliaries, and of separate (or additional) platoons of approximately fifty each. These companies have company headquarters and three platoons. A Type Post Headquarters Company (based on Army unit now in existence) is shown below.

TYPE POST HEADQUARTERS COMPANY
(Based on Army unit now in existence)

| Company Headquarters | Clerical Platoon | Communication Platoon | Service Platoon |
|---|------------------------|---|-----------------------|
| 3 Officers | | | |
| 1st Officer — Company Commander | | | |
| 2d Officer — Executive and Mess Officer | | | |
| 3d Officer — Supply & Police Officer | | | |
| 1 — 1st Leader (Company First Sergeant) | | | |
| 3 Leaders (Mess, Supply, Bakers) | 1 Leader (Chief Clerk) | 1 Leader (Chief Switchboard Supervisor) | 1 Leader (Supervisor) |

(Table Continued on Page 48)

MILITARY REVIEW

TYPE POST HEADQUARTERS COMPANY (Continued)

| Company Headquarters | Clerical Platoon | Communication Platoon | Service Platoon |
|--|--|---|---|
| 4 Junior Leaders (Company Clerk — Unit) | 4 Junior Leaders (Ass't. Chief Clerk; Platoon; Records & Postal) | 3 Junior Leaders (Switchboard Supervisors) | 2 Junior Leaders (Dispatchers, Motor Transport) |
| 13 Auxiliaries 1 Typist (3d Class Specialist) 3 Cooks (1 — 1st & 1 — 2d Class Specialist) 3 Cook's Helpers 6 Orderlies [Dining Room; Office; Record Room (3d Class Specialists) & 3 — Barracks] | 65 Auxiliaries 10 Stenographers (5 — 1st & 5 — 2d Class Specialists) 30 Typists (10 — 2d & 10 — 3d Class Specialists) 10 Clerks, general (5 — 3d Class Specialists) 15 Clerks, Postal (5 — 3d Class Specialists) | 22 Auxiliaries 2 Stenographers (1 — 1st & 1 — 2d Class Specialists) 4 Typists (2 — 2d & 1 — 3d Class Specialists) 16 Switchboard Operators (4 — 2d & 4 — 3d Class Specialists) | 27 Auxiliaries 4 Clerks (MT) (2 — 2d & 1 — 3d Class Specialist) 16 Chauffeurs (8 — 2d & 8 — 3d Class Specialists) 7 General Duty |
| 3 Officers 8 Leaders 13 Auxiliaries | 5 Leaders 65 Auxiliaries | 4 Leaders 22 Auxiliaries | 3 Leaders 27 Auxiliaries |
| 24 Aggregate | 70 Aggregate | 26 Aggregate | 30 Aggregate |

TOTAL STRENGTH SUMMARY FOR ENTIRE COMPANY

3 Officers 7 Auxiliaries (Specialists 1st Class)
1 1st Leader 33 Auxiliaries (Specialists 2d Class)
6 Leaders 36 Auxiliaries (Specialists 3d Class)
13 Junior Leaders 51 Auxiliaries (Non-rated)

3 Officers — 20 Leaders — 127 Auxiliaries

WAAC Ranks and Grades compared to those in the Army are as follows:

| WAAC | Army |
|-------------------------|---|
| First Officer | Captain |
| Second Officer | First Lieutenant |
| Third Officer | Second Lieutenant |
| First Leader | First Sergeant |
| Leader | Sergeant |
| Junior Leader | Corporal |
| Auxiliary | Private |
| Specialist First Class | Technician Third Grade (Staff Sgt. T.) |
| Specialist Second Class | Technician Fourth Grade (Sgt. T.) |
| Specialist Third Class | Technician Fifth Grade (Corp. T.) |

Units should be requested in increments of approximately 50 auxiliaries. Several units as required will be furnished. Each unit will arrive with its own

administrative overhead and with sufficient training to be able to assume its proper duties with the least practicable delay. Approved plans for the construction of buildings for units of 50, 100, 150, and 300 auxiliaries are available in the office of all district engineers. Funds for the construction will be available on application. In the selection of a building site for a WAAC unit, consideration should be given to slight segregation from soldiers' barracks, in addition to the usual considerations of existing utilities, health and guard.

It is realized that the "type" units will not fit the needs of any one particular station. For this reason it is necessary to determine what changes are desired in the composition of units to be assigned to each post or camp.

The general impression was initially gathered by various Army officers that WAAC units would be used, in the main, for work in the Air Warning Service. This idea occurred undoubtedly because the Air Warning Service was the first to use women in numbers and that use was publicized by newspapers and newsreels. Nothing could be less accurate. Not only are WAAC units being organized and trained for the normal, orthodox, overhead or housekeeping jobs at posts, camps and stations but specialists will be enrolled as requested for special duties at Army installations. The following table illustrates how a Miscellaneous Platoon will be recruited and furnished upon requisition.

TYPE ADDITIONAL PLATOON (Special Service)

Miscellaneous Platoon:

| | |
|---------------------------------|--------------------------|
| 2 Leaders | 6 Housekeepers |
| 1 Theater Cashier; | 4 Motion Picture Proj. |
| 1 Ass't. Hostess | Oprs. (2—1st & 2—2d) |
| 5 Jr. Leaders | 4 Receptionists (4—2d) |
| 2 Ass't. Theater Cashiers | — |
| 2 Housekeeping Supervisors | Aggregate: |
| 1 Chaplain's Ass't. | 7 Leaders |
| 20 Auxiliaries | 2 1st Class Auxiliaries |
| 4 Theater Ushers | 8 2d Class Auxiliaries |
| 2 Cashiers (Bookkeepers) (2—2d) | 10 Non-rated Auxiliaries |
| | 27 Total |

The accompanying list shows in part the specialists or skilled technicians who will be recruited for specialized services:

| | |
|---------------------|-----------------------|
| Accountants* | Draughtsmen* |
| Bakers (W) | Hostesses' Aids |
| Book Binders* | Library Aid* |
| Bookkeepers* | Messengers |
| Cashiers: | Mimeograph Operators* |
| Cafeteria | Printers* |
| Theater | Radiographers* |
| Clerks: | Radio Operators* |
| Chaplain's | Radio Technicians* |
| Chief or Principal* | Receptionists |
| Commissary | Secretaries |
| Distribution | Statisticians* |
| File | Stewardess |
| Information | Store Accountants* |
| Library | Storewomen |
| Postal | Telegraph Operators* |
| Record | Telephone Operators* |

THE "WAACS" ARE HERE

| | |
|----------------|---------------------|
| Cooks (W) | Teleprinters* |
| Cryptographer* | Teletype Operators* |
| Dieticians* | Theater Ushers |
| Drivers: | Typists* |
| Light Truck | |
| Passenger Car | |

* Recruited as Skilled Technicians
"W" For service with WAAC units only.

The present school facilities limit the training of specialists to the following:

1. Clerks (Army Administration)
2. Cooks and Bakers (for WAAC units only)
3. Chauffeurs (for light cars only)

As additional training facilities and opportunities are developed the scope of specialist training will be broadened to the end that Cooks and Bakers be supplied to service organizations other than WAAC units. This same progress in training will further permit other personnel to be made available for Army installations in a wide range of duties and from time to time.

The peculiar knowledge, skill and special training of the women of our Nation are thus made available to the Army and the war effort. A survey was recently made of the administrative and overhead installations at a large southern post. The results indicate that many thousands of Officers and men might be freed from post duties and released for field service if and when a sufficient number of WAAC units can be made available for use there.

A better understanding of the true value of the WAAC can be gained from a detailed study of the figures given below which resulted from the survey of the post mentioned above and where also one of our better known service schools is located.

It is estimated that in each of the 30 Training Battalions of the Officers Candidate School there are 56 enlisted men (Cooks—Bakers—Mess Sgts.—Supply Sgts.—Clerks, etc.) who could be replaced by a total of 1,680 WAAC personnel. In the Officers' Classes there are a total of 900 similar replacements possible and in the Motor Maintenance Battalions there are a total of 2,850 drivers—Ass't. Drivers—Mechanics—Dispatchers—Technicians—Clerks, etc. who, with the 2,580 men listed in the first two activities above, make a total of 5,430 soldiers who can be released to tactical units for combat service.

The reader can readily think of many more fields in which the WAAC may be employed. To name only a few let us reflect on such other vocations as those in Hospitals, Communications, Finance, etc., etc.

In the ranks of the WAAC we find women who are enthusiastically patriotic using the WAAC as the

vehicle for public service. Many of these women have sacrificed civilian positions of far greater financial remuneration in order to participate in and make personal contribution to the Nation's war effort. Their talents, loyalty, devotion to duty, and a fervent patriotism are now available to the Army and must be capitalized.

These women further realize that women are no longer exempted from personal contact with the agencies of war. Hostile war planes use rear areas, dwellings and manufacturing plants wherein women live and work, as their targets for destruction to the end that human psychology in general and feminine reactions in particular cry out for the opportunity for active participation in national defense and the war effort as a whole.

The American woman is alert mentally and physically; she has enjoyed opportunities of education, social well being, and political independence with the result that she feels a vivid personal responsibility in her own and the Nation's security and future. She is amply qualified for this individual contribution to the national defense. She uses the WAAC as her medium of expression.

The WAAC is a truly American type institution. It is not patterned after any foreign counterpart. It permits of equal opportunity for all classes and creeds. It is used directly with the Army, with any and all of its arms and services. The WAAC serves under Army supervision. The Army therefore has a definite responsibility to the WAAC.

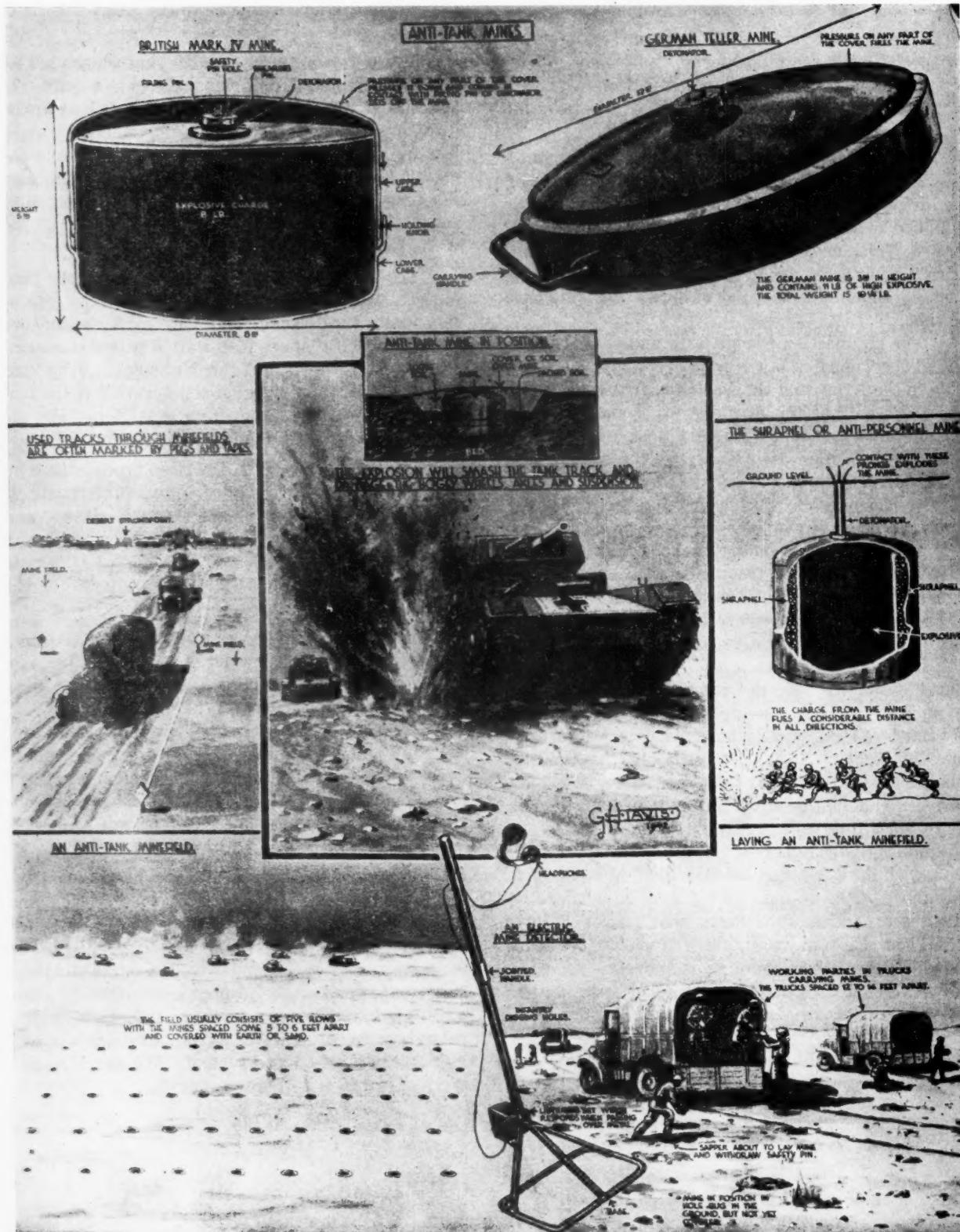
In its realization of this responsibility the Army would be derelict if it did not make the best possible use of the WAAC. Abilities, specialized training, and human equations never before available to it, are now ready to assist the Army in its work. Careful study and planning by military commanders everywhere, tending toward the efficient employment and application of these qualities, should be continuously engaged in.

Objectively we realize that our mission is to destroy the hostile armed forces. To this end we subjectively apply our efforts to the creation and training of an adequate army the personnel of which comes from our national manpower reservoir. The conservation of this manpower, the efficient use of this manpower and the prompt availability of these effectives in constantly increased numbers, is our immediate concern. The WAAC stands ready and willing to assist us on every hand. We are a Nation truly united in our Country's service.

Antitank Mines

A Deadly Defensive Weapon in Mechanized Warfare

Drawn by G. H. Davis, Special Artist of *The Illustrated London News*.



(See Page 51 for Text)

The Illustrated London News.

Field Artillery In Offense

BY
COLONEL RICHARD H. BACON, *Field Artillery*,
Instructor, Command and General Staff School.

Colonel Bacon's article is based largely on a conference given by him during the course of instruction at the Command and General Staff School. This accounts for the brevity of some of the information which, in actual practice, served only as background for classroom discussion. It is believed that this article lends itself for instructional use by commanders of units of all arms.—THE EDITOR.

The purpose of this conference is to discuss certain general principles on the use of Field Artillery in offensive combat. Particular emphasis will be placed on division artillery; corps and army artillery will be mentioned briefly.

In the offensive, troops are distributed in two or more principal tactical groupings: one or more main or decisive attacks, and one or more secondary or holding attacks. The greatest possible offensive power is concentrated in the tactical grouping for the main attack. The mission of field artillery in the attack is to support the infantry with fire. This support is rendered by neutralizing or destroying the most dangerous enemy targets within range. Such targets may be the enemy's artillery, centers of resistance, troop concentrations, movements of reserves etc.

Division artillery is most effective in fire on unprotected personnel. It is used to blind enemy ob-

servations, to prevent movement of reserves and to assist in counterbattery fires.

Corps Artillery has as its principal mission the neutralization or destruction of the hostile artillery. It is also used in the destruction of hostile defenses, in fire on rear areas and to reinforce the fires of division artillery.

There is no artillery organically in an Army. Army has an artillery headquarters and such units as may be allotted to it by G.H.Q. Its principal missions are distant interdiction and destruction and to reinforce the fires of Corps artillery. Some or all of the units given to Army by G.H.Q. may be suballotted to lower units.

When there is additional artillery attached to the division, either from corps or through corps from Army, temporary groupings may be formed for convenience in the execution of missions. Such groupings are based on the nature of the mission rather than on the type or caliber of the weapons.

Infantry has two principal means of action—fire and movement. Infantry uses fire to overcome enemy resistance. Artillery is the most powerful supporting arm in the division. Artillery moves its fire from one portion of the front to another as requested by the infantry unit it supports or as directed by the division commander. It is a powerful means of adding to the fire of infantry weapons. Fire is moved to best support the infantry. Guns are never moved as long as they can do this support job effectively.

ORGANIZATION FOR COMBAT.

Now, how is this fire controlled? The answer to that question is the key to proper artillery support in any combat. There are two methods. One is for the division to keep the artillery under centralized control and so enable the division commander to mass fires where and when they are needed. The other method is to attach the artillery to subordinate units, say an infantry regiment. There are advantages to each method. Sometimes a combination of the two is best. The question to be decided is, who can best exercise that control?

Direct Support.—When artillery is kept under division control it is placed in direct support of an infantry unit or in general support of the division as a whole. When the division order specifies that a battalion of light artillery will be in direct support of a certain infantry regiment, orders are issued to that battalion to be prepared to fire in the zone of action of that infantry regiment, to respond directly to

Types of British and German Land-Mines

A Desert Minefield Being Laid, and In Operation

(Illustration on Page 50)

Minefields play an increasingly important part in land warfare. With the development of the tank, the tank-mine became an inevitable development against these mobile land forts, and is probably most important of all defensive weapons against the tank. A minefield is laid in such a way that a tank cannot pass over a field without exploding one or more mines, and these are capable of smashing the track, bogie wheels, suspensions and axles of the heaviest tank. The method employed is to make a hard bed for the mine, remove the safety cap from the detonator and lightly cover it. The fields are very carefully charted, as with sea-mines, and when a minefield is laid near a well-used track, the "road" through is marked by tapes and pegs, as shown, these being, of course, withdrawn when an attack is apprehended. In laying or removing mines near an enemy position the work is carried out at night and is a dangerous job for the skilled Sappers employed on it. There are various secret devices used in detecting the position, like the Russian-type detector in this illustration, so constructed that when passed over hidden metal it detects the mine's position. Our artist's drawings give a comprehensive picture of mines, a tank minefield being laid, and in operation.—Extract from *The Illustrated London News*, 6 June 1942.

calls for fire from that regiment and to maintain liaison with the headquarters of the infantry regiment and with its front line battalions. Of course they must be able to observe in that zone of action. It means that the battalion will comply with every request for fire made by the infantry regiment, but that instructions from the division will have priority. The division may have ordered that battalion to be prepared to reach a certain area in another regimental sector with its fires; so the artillery battalion commander may not be able to comply with a request from the infantry that he occupy certain positions which the infantry commander feels may be more desirable. He will occupy positions from which he can support the infantry, all right, but from which he can also comply with division orders as to where he shall be able to move his fire.

When the division order attaches a light battalion to an infantry regiment the infantry regimental commander does not request, but orders what he wants as to position areas and fires. In such cases the artillery battalion has *one* mission—that of supporting the particular regiment to which it is attached. It does not have to consider any requirements for fires in support of another infantry unit except as so ordered by the unit to which it is attached. The distinction between direct support and attached artillery is one of command. Attached artillery is under the command of the supported unit; direct support artillery remains under control of the division commander. Field Service Regulations tell us that Field Artillery operates most effectively under centralized control. Insofar as the artillery support received by an infantry regiment from a battalion of artillery is concerned there is absolutely no difference between direct support and attached artillery. In either case the artillery sends liaison officers to the supported unit. It sends out forward observers, puts its CP with or near the infantry CP and complies with every possible request for fire. The first consideration in the location of a battalion CP is control of the firing batteries. The second is to be with the supported commander. The location of CP's is something staff officers should check on during the training period. If artillery and infantry CP's are not together, find out why. It may be that no good reason exists for the separation. Co-operation is essential. In some cases the infantry may find it to their advantage to locate their CP's in the same area selected by the artillery, especially in those cases where the artillery cannot come to the infantry location because of the necessity of control of the batteries.

Artillery should be attached to subordinate units when control can not be efficiently exercised by division. Situations when attachment may be desirable are: marches, advance or flank guards, pursuits, unusually wide frontage, difficulties of terrain or when signal communication is incomplete or insufficient.

Direct support artillery functions as attached artillery when communication with division is broken, and continues to so function until communication is reestablished. On the march artillery is placed within the column so as to insure its protection but primarily to insure its availability for early and adequate support of the security forces and the initial action of the main body. At the earliest indication of contact the advance guard artillery occupies positions to render timely support. Against a strong enemy a decision to develop and deploy for attack directly from march columns risks loss of control and sacrifices some of the capabilities of the artillery. Many infantry commanders will be found who want the artillery attached to their regiments under all circumstances. In making such a request they are passing up a valuable means of support. Direct support is actually more desirable from the standpoint of the infantry. By this organization for combat the infantry that needs additional fire can get it. Whereas if all the light artillery is attached, only the general support artillery is available for reinforcement.

Centralized control and centralized planning for the use of the artillery means that infantry regiments are to get the maximum artillery support at all times. It is true that artillery in direct support may be called on to fire outside the zone of action of the regiment it is supporting and so deprive its infantry of support while so engaged. Remember though that such a mission takes only a short time and that direct support artillery will immediately and automatically switch its fires back to its own supported unit upon completion of the mission. There are going to be many times when every infantry regiment will want additional artillery fires on its front. Infantry commanders should feel more secure when they can get the bulk of division artillery to support them than they would if that support were going to be limited to the artillery attached to them. Many officers have seen the demonstration at Fort Sill of the massing of fires of all the division artillery. It is an impressive sight. The effect of that fire is devastating. It is desirable that that power be kept under division control whenever the division is able to exercise such control. Please don't get the impression that artillery should never be attached. There are many situations when attachment is best. When such situations arise don't hesitate; decentralize. Remember that decentralization due to wide fronts and frequent displacements may be the rule rather than the exception. In this connection take steps during training to develop the battery as an effective fighting unit. It may be well that batteries will have to be attached to battalions; communications may break down. If such situations arise, batteries will be wanted that are able to function away from the fire direction center of the battalion.

FIELD ARTILLERY IN OFFENSE

General Support.—Artillery placed in general support, supports the entire unit. In the infantry division the medium artillery is normally placed in general support. Light artillery whose companion infantry regiment is not committed may also be placed in general support. Remember that it is unusual to place artillery in reserve. The artillery reserve is its ammunition. An artillery battalion held out of an offensive is of no value. If the infantry regiment which it normally supports is held out the artillery should be used. By placing it in general support it can be changed quickly to direct support or attachment if and when the infantry regiment is committed. All or part of the artillery in general support may be ordered to reinforce the fires of light artillery in direct support when it is not firing some mission ordered by higher authority.

When the division is part of a corps, the corps artillery may be in general support of the corps as a whole, or part may be in general support and part attached to one or more divisions of the corps. The corps artillery brigade consists of a 155 gun regiment, two 155 howitzer regiments and an observation battalion. This observation battalion should not be confused with an observation squadron. It consists of sound and flash ranging batteries. It is a two battery battalion, both batteries having the same organization: one sound ranging platoon and one flash ranging platoon. If your division has corps artillery attached to it plan to push those units well forward. If it operates under corps control, expect to see corps do the same. One can expect to see units of the observation battalion well forward to enable it to get timely information on enemy artillery positions for counterbattery purposes. When the division is operating as part of a corps, the corps artillery will usually execute the counterbattery fires. Corps may call on the medium artillery to assist in this important task. Corps must also assist the medium regiment. There is no counterbattery section in the battalion headquarters battery. Personnel from the corps brigade counterbattery section should be attached to the medium regiment when that regiment is expected to execute all counterbattery fires.

POSITION AREAS.

In the offensive the artillery is put in positions initially just as far forward as the situation will permit. By so doing all the artillery will be able to fire longer as the infantry advances, thus rendering maximum support as deep into the hostile position as the range of the piece will permit. Placing artillery well forward facilitates observation and the installation and maintenance of communications. A battalion in direct support usually occupies positions in the zone of action of the unit it supports. A battalion in general support usually occupies positions in the zone of action of the division. Corps and army artillery should be placed well forward so they will

be able to furnish support during displacement of the division artillery. Division artillery should start to displace forward by batteries within battalions before the infantry gets out of range. Artillery positions should be kept as far forward as conditions permit. Take advantage of any lulls in action to displace forward. It is especially important for the armored division artillery to do this even though it means more frequent moves. Artillery must render close and continuous support. The artillery battalion commander has two things to look out for—he must not let the supported unit get too far ahead nor get beyond the range of some of his guns.

While echelons are moving forward the support will be decreased in proportion to the number of batteries on the move. Some artillery should always be in position to support its infantry no matter how fast or how far that infantry may advance. Leave the selection of position areas to the artilleryman unless for some reason it is necessary to restrict him to certain terrain in a particular situation. Tell the artilleryman where the fire is wanted but let him select the position areas to meet such requirements.

How can the staff officer assist the artillery in planning displacement? Everyone has heard and will continue to hear a lot about advance planning. Its value to the artillery can be illustrated in connection with displacement of artillery. Artillery must be permitted to displace forward without orders from division headquarters. Just as soon as artillery can do its job better in a more advanced position it should be moved. This means better support for the infantry. In this way only will there be close and continuous support. The division staff must keep the artillery informed of plans for the advance of the division. Where are the artillery fires to be massed? The area prescribed for this will influence the position area which will be occupied. If the artillery commander—the artillery battalion commander—knows this he can select his new positions intelligently with a view to supporting his infantry and the division as a whole. Don't make him delay his displacement and consequently weaken his support to the infantry because there are no plans for him. Of course, he can displace forward without your plans; however, he may then move into positions from which he can do a good job for his supported unit but from which he can not reach the area later prescribed for him to be able to mass his fires. This may cause an extra move, or the division may go without the fires of that battalion when it is needed badly.

SUPPORTING FIRES.

Artillery fires in support of offensive combat are divided into three phases.

1. Fires prior to the artillery preparation.
2. The preparation.
3. Fires during the attack.

Fires prior to the preparation comprise fires in support of the advance guard action, including the development and deployment of the main body, and fires in support of preliminary combat to drive in the enemy covering force and develop the main hostile position. They include long range interdiction, counterbattery, neutralization and harassing fires.

Interdiction fire is fire delivered on points or areas to prevent the enemy from using them. Examples of characteristic targets for this type of fire are roads, crossroads, assembly areas, railroad stations, detraining points, defiles and bridges. All echelons of artillery use interdiction fire; however it is the particular job of the corps and army artillery. They interdict the more distant points of areas.

Harassing fire is fire delivered during relatively quiet periods to interfere with and annoy the enemy, to keep his troops alerted unnecessarily. All echelons use harassing fire; it may be by single pieces, platoons or battery and is intermittent. The division artillery may use roving guns and fires usually in the enemy forward areas.

Neutralization fire is intended to cause heavy losses and interrupt movement or action. Best results are obtained by surprise fires in intense masses. A transfer of fire is necessary to obtain surprise.

An artillery preparation is heavy fire delivered during the period just prior to the jump off of the attack. It is designed to secure domination over hostile artillery and infantry. All artillery participates in the preparation. The preparation should last long enough to accomplish the effect sought but should not be so long as to permit time for the enemy to change his tactical dispositions. The amount of ammunition available may govern the duration. An artillery preparation is divided into two or more phases. During the first phase all echelons of artillery—army, corps and division—try to knock out or neutralize the hostile artillery. Units not required for counterbattery neutralize the enemy systems of command, communication and observation. During the second phase the corps and army artillery maintain the neutralization of the enemy artillery. Division artillery executes interdiction, blinds enemy observation and neutralizes enemy defense areas and reserves, destroys mine fields and obstacles. During the third phase, army and corps artillery continue to maintain neutralization of enemy artillery. The division artillery, reinforced by units of corps artillery not required for counterbattery, concentrates on the enemy forward defenses. All available artillery participates. Start working on the enemy in his rear, maintain the neutralization attained, and in the final phase put everything available on his forward defenses. The division artillery during this last phase masses its fires on defensive positions in the forward area with priority to those areas which most seriously threaten the attack. During the attack, fires are concentrated on the front where the attack

is making the most progress. During the attack, the division artillery assists the infantry by attacking defensive areas, mine fields, wire entanglements and emplaced weapons. They assist the infantry in gaining fire superiority for each successive objective at the proper time and place. They also protect the supported unit during periods of reorganization. The division artillery does all of this with successive concentrations. A concentration is a volume of fire placed on an area in a limited time. Prior planning for the use of artillery is essential. Cooperation and coordination is of the greatest importance. The supported infantry and the supporting artillery commanders plan together prior to the attack. They plan for as many fires as possible.

The infantry commander informs the artilleryman of his plans. He points out areas and if possible specific targets on which artillery fire should be placed prior to and during the attack. The artillery commander states how he can most effectively support the infantry attack. If possible, he points out or indicates his position area, his observation posts and the terrain on which he can deliver fire. In particular he indicates observation posts that should be captured during the advance. Here are some of the things covered by the artillery battalion commander and his supported infantry unit commander.

Points or areas to be covered during the preparation—remember that the decision as to what preparation is to be fired is a command decision. Its duration and time for opening fires will be prescribed by a higher commander. If it is a division attack the division commander, if by corps or army the corps or army commander.

Areas to be smoked.

Which infantry assault battalion is to receive priority of fires.

Areas where bulk of fires is to be massed.

Other fires to be prearranged as to location and fired on call.

The signal to be used for lifting or shifting the artillery fire.

All of these have to be coordinated with fires ordered by higher headquarters. There are some ways staff officers can assist these infantry and artillery commanders in their planning. Give them early information on the division plans. Don't wait until the division order is published to inform both of them about plans. Keep them informed and keep them up to the minute with changes. The more time that is given these two to work up their plans, the more effective will be the support which the artillery can render. Staff officers must insist on cooperation and give their share of it. Inspect to see that it is being achieved.

In an attack against an organized position time will usually be available to plan these fires in considerable detail. In a fast moving situation less time will be available and there will be less information

FIELD ARTILLERY IN OFFENSE

of the enemy. Only the initial fires can be planned for delivery on a prearranged time schedule. Subsequent fires will be planned for delivery during the attack on call from the infantry when needed. In addition the artillery will be prepared at all times to fire on targets which appear during the attack and which are dangerous to assault echelons.

Staff officers must all be deeply concerned over the resupply of ammunition. G-4 is not the only staff member who has to worry about that. Remember that artillery without ammunition is of no value. The *more* ammunition you fire, the more help your artillery is going to be in any attack. Don't let the unit of fire as defined in your text books limit you. Remember that is an average for purposes of estimating your requirements. At least one battery of light artillery in 1918 fired four thousand rounds of ammunition in one day. That requires lots of transportation, lots of man hours of labor to handle. When artillery trucks are taken to motorize an infantry battalion, as is often done in maneuvers, some infantry unit is being deprived of valuable help. The more artillery ammunition that can be handled and fired, the more the infantrymen are going to appreciate artillery support. It is a fact that unless one can move infantry units where they are wanted, artillery is not going to have support work to do. On the other hand infantry without maximum artillery support is not efficiency. The officer must strike his own balance in each situation. One hears it said that ammunition is expensive and, because of shipping difficulties, should be used sparingly. Ammunition is cheaper than human life and a lot easier to ship to any theater of operations.

GENERAL SUPPORT ARTILLERY.

Lets discuss briefly the use of general support artillery. Medium artillery is usually in general support. Light artillery whose companion infantry regiment has not been committed may be placed in general support. Medium artillery in an attack is going to have some counterbattery fires to execute. If the enemy artillery can be neutralized prior to or during the attack, chances for success are greatly increased. Enemy battery positions are going to be hard to find. Remember, he is not going to disclose or even occupy his positions until the attack is about to start. The corps observation battalion with its sound and flash ranging batteries is going to help locate them. However, the division now has its own means of assisting. I refer to the light observation planes now a part of the division artillery. It is planned to have two of these light planes for each artillery battalion. They are to be flown by artillerymen; the observer is to be an artilleryman. Artillery is going to have its own elevated OP's. This is going to be of great help in improving support given to infantry. In country like Louisiana it is almost impossible to find a ground OP where anyone can see very much. Now, when operating in such coun-

try, the guns will have much better eyes than before. These light planes can land and take off in small areas, even on country dirt roads. They will fly about 500 feet elevation, stay up just long enough to do the job assigned and then come down and hide. We are going to have losses, but then, a forward OP has always been a dangerous place. Attempts are made to knock out or blind the enemy's OP, and of course he does the same with ours. G-2's are going to get a lot of information from these planes; they are going to want to send them off on G-2 missions away from the artillery. Infantry regimental commanders are going to want to use them; G-3's will want to use them to find out where their own units are and how they are progressing. Here again one has to strike a balance as to how they should be used. Before taking them or allowing the infantry regimental commanders to take them, consider that possibly the artillery can get all the information needed while the planes are being used for the purpose for which they are intended, namely, adjustment of fires and observation. Remember, they are not suitable for use over the enemy lines. They are too slow and too vulnerable to enemy small arms fire. They have no armor or armament. They must rely on accomplishing their mission in a hurry and then getting back on the ground to a camouflaged position.

Counterbattery is only one use for artillery in general support. In fact, this use may take a relatively small part of the time since it will often be taken over by corps artillery. All general support artillery may be called on to reinforce the fires of direct support units. Plans for this should be made in advance. When placing artillery in general support it may be prescribed that certain units will be prepared to reinforce the fires of certain direct support units. Usually it is the unit supporting the main effort whose fires you want reinforced. Such a prescription in the division order will limit the position area of the general support unit. It must select positions from which it can deliver these reinforcing fires, possibly at the expense of some other portion of the division front. The general support unit will establish liaison with the unit whose fires it is ordered to reinforce. This liaison will include the necessary signal communications. It permits requests from reinforced units to be answered quickly.

COORDINATION.

At the beginning of this article it was stated that in the offensive there are usually two tactical groupings, one making the main attack and one the secondary or holding attack. These attacks are often launched in converging directions. Careful coordination is necessary to prevent the artillery supporting one attack from firing into troops making the other. This is particularly true as troops near the objective. One means of attaining this is to establish

coordinating lines, laterally and in depth, beyond which units are forbidden to fire after a certain hour or after receipt of a prearranged signal or message.

FLEXIBILITY.

An attack seldom proceeds exactly as planned:

for example, the secondary attack may make unexpected progress and become, in effect, the main attack. Artillery plans must be flexible in order to meet this contingency and also to meet counterattacks.

If Japan and America Fight

A Japanese Forecast of the Present Conflict.

By

LIEUTENANT COLONEL SYDNEY V. KIBBY, *Medical Corps,*
Special Services and Public Relations Officer,
Billings General Hospital, Fort Benjamin Harrison, Indiana.

In 1920 there appeared in Tokyo a book with the title "If Japan and America Fight," by Lieutenant General Kojiro Sato, retired, of the Japanese army. He was known as the Japanese Bernhardi. An English translation appeared May 26, 1921, which was almost immediately suppressed. Only two copies are known to exist. One was secured for the state department by Mr. Edward Bell of Tokyo and the other is in the possession of the Reverend John Cole Mc-Kim, who has kindly made it available for this study—most interesting in the light of recent events.

The author, General Sato, disclaims any belligerent intention or desire to produce ill feeling between his country and the United States, which he admits might result in disaster to the Japanese Empire. His purpose, he states, is to arouse his fellow countrymen from their dreams of self complacency in the face of the third great national crisis since the foundation of their nation.

He finds their situation paralleling that of Japan just before the Mongol invasion or that during the period of the Russian aggression, and laments the fact that his countrymen fear themselves no match for America. Japanese statesmen, travelers, and even military men, he states, are afflicted with American phobia and ideas of Japanese inferiority.

His thesis is that the Japanese are superior in mind and spirit and the Americans only in material things. American successes in the first world war he ascribes to the exhaustion of the other combatants. This success, he states, has made Americans brag and boast and seek to interfere with Japan's historic and geographic mission to develop the continent of Asia. This, he says, would not be aggression, because continental development is necessary for the existence of Japan. America is pursuing her capitalistic imperialism and cruelly trying to cut the roots of Japan on the continent. The American menace is greater than the Russian menace in 1904 because it is more insidious. Japan always wins her wars by

her moral strength though her enemy be superior in material strength. He warns the American reader of his book of the foolishness of attacking Japan, or of irritating her about the California question. The immigration restriction and denial of a quota to Japan was to come later.

General Sato has in mind a war between the United States as it would have been fought twenty-two years ago, and did not foresee the present alignment of world powers. He takes for granted the neutrality or non-interference of Great Britain and the impotence of Russia and China. He did not foresee the clash of ideologies or the important part destined to be played by air craft.

The book is intended to be a study and comparison of Japanese and American psychology with reference to waging war. His purpose is to reassure his countrymen as to the advantages which he believes they have in this respect. That this subject is of interest to our military authorities is evidenced by two articles on the psychology of the Japanese soldier by Captain (now Lt. Col.) Warren J. Clear, assistant military attache at Tokyo, 1923-1927, in the Infantry Journal about 1929. The General's book presents the Japanese view on this subject.

The average American according to the General resembles the traditional "Yedoko," or citizen of Tokyo, "who makes a show of authority with characteristic caustic remarks, giving the devil to his adversary, but when faced with pluck proves a coward at heart." American courage and morale are not so well able to withstand the shocks of disasters such as the sinking of large naval vessels and transports. Occupation of the Philippines and Alaska will render attack by the American fleet most hazardous. During the first phase the main Japanese fleet will hide in a suitable rendezvous, while the American fleet will come sailing through a deserted ocean. The nerves of the American sailors will be all unstrung by such objects as flying albatrosses and floating

IF JAPAN AND AMERICA FIGHT

whales. The American captains will be unable to sleep or rest. Submarines and mines will still further contribute to their anxieties. Meanwhile the Japanese will wait with ease for the exhausted Americans and suddenly attack them from the flank as they begin to waver like a spent bullet.

The General agrees with Bernhardi that an attack on the mainland of America would be a difficult feat, but that Japan could occupy the Philippines, Guam, and Hawaii without paying too high a price. He expects a ten-year war requiring the utmost economy of powder, coal, oil, and money. It will be necessary to draw on China and Siberia for provisions and war materials. For this Pacific war, peace on the continent of Asia will be necessary. The Japanese must there make the money necessary to carry on the war. The help of British, French, Italian, German, and Austrian experts is expected.

The role of the Japanese army in this struggle will be to safeguard Japanese economic roots on the continent of Asia. Natives and foreigners in Asiatic countries are to be allowed to engage in their industry in peace and even be protected so long as they do not interfere with the economic development of Japan.

General Sato hopes for the neutrality of Britain, but is of the opinion that crafty Britain is not to be trusted, particularly if the initial surprise attacks on the United States should be defeated. The Japanese are urged to wage the war within the limits of justice and humanity so as not, like Germany, to lose the sympathy of the world.

If the Americans, becoming impatient, should attack early in the contest, they would have to cross thousands of miles of water and consume enormous daily amounts of war materials. If the American fleet should not attack, Japanese strategy would then be to build up her commerce and industry with and on the Asiatic continent, meanwhile inflicting losses on the American fleet by submarines and mines. Public opinion in the United States would be against the capitalistic war. Meanwhile, death-daring bands of 2,000 or 3,000 men would make surprise attacks on various points on the mainland and possessions of the United States in order to terrorize the American people. In the words of Sun Tze, the ancient Chinese sage, "To wait at ease to take advantage of the exhausted enemy," or "to wait quietly to take advantage of the excited enemy," as is done in the practice of judo or jujitsu.

In the crisis of the Mongol invasion and in that of the Russian aggression the Japanese won "by mean of the indomitable will-power of the men of the God's country." Now, a stronger enemy than either has appeared, the United States, the real strength of which is not their army and navy, but their industrial and financial resources. The United States is twenty-one and one-half times as large as Japan proper. The population is only one and one-half times as great. The density of population is 400 per square

mile in Japan but only 31 for the United States. If the same density prevailed in the United States as in Japan, the population would be 1,200,000,000. The weakness of the United States is that about 30,000,000 people are of racial stocks different from the bulk of the population. About 12,500,000 are German and 15,000,000 are colored.

The grace of Heaven or the grace of His Majesty, the Emperor, or perhaps we should say the belief in that grace, is the invisible factor which made Japanese armies, inferior in numbers, more powerful than the larger armies of the Mongols and Russians. The patriotism of the Japanese and the impregnability of Japan make them unconquerable.

Americans are filled with the spirit of enterprise; the Japanese appear ease-loving. The strenuous life is the American ideal. Leisurely retirement is something of which Americans never dream. The Americans build skyscrapers, dig the Panama Canal, and create huge fortunes; but the Japanese have not bridged the Shimonoseki Strait nor tunneled Tsushima Strait. American industrial enterprises employ largely machines, while hand-labor is the rule in Japan. Americans are impatient and quick tempered, and become reckless and careless. The Japanese cannot continue at work steadily without rest like the Americans, but in times of war they show a wonderful energy. The war spirit in America is spectacular; that of Japan is gloomy and quiet, like that of the forty-seven ronin of Ako, who avenged the death of their lord and then all committed seppuku, or honorable suicide, a story well known to Japanese theater goers.

Americans work well in groups in peace as well as in war. The Japanese are far behind the Americans in this respect. The Americans spend much time in discussing. When a decision is arrived at or once decided they show a wholehearted loyalty for the undertaking, even those of diverse racial stocks. Americans are very strong in their sense of duty, especially the educated and the political and civic leaders. In Japan the opposite is the case. The educated and the wealthy shun conscription both in peace and war. The Japanese as a people do not consider death a serious matter. When they meet a desperate situation, lacking in power and endurance, they commit suicide. Americans and other western people do not recklessly commit suicide, and they lack the determination to die when they should.

The Japanese have never fought a defensive war, and should be deeply concerned about the problem of internal morale if they should have adversaries. A country on the defensive must unite as one man. The Japanese being one great family, having common imperial ancestors, should do this better than the Americans with their different racial stocks. American patriotism is a kind of self-confidence arising from attachment to a vast and fertile land.

In Japan patriotism calls upon the people to defend the stainless and perfect country with the

MILITARY REVIEW

Imperial family of lineage unbroken for ages as their national center. It is an ardent devotion and courage born of a sense of duty to regard one's life insignificant in the service of defending the country. The Japanese Navy particularly is noted for its adventurous spirit and deeds of daring, while the United States Navy is untried in modern war.

The Japanese Army has adapted to itself the best lessons of the French and German Armies, even improving on its teachers. In leadership and commanding it is the best in the world. The training of American officers is theoretical rather than practical. The small pay of Japanese officers is a handicap in securing the best material. Americans are more likely to depend upon machine power, but in spite of the importance of these, manpower must be the chief reliance for victory.

Japan, though criticized as a military and aggressor nation, is in no wise different from Spain, Portugal, Holland, Great Britain, France, Germany, and the United States. Weak nations have declined and become the prey of stronger ones and so civilization has progressed.

Where economic development has been promoted by navalism and militarism, capitalistic imperialism has been the result. The conflict of these imperialisms led to the first world war. The Far East in 1920 was like the Balkans before the first world war.

By means of railways and automobile roads, Britain has been planning to secure economic and political control of Africa, the Near East, India, Tibet, and China, and the United States of Alaska, Siberia, and China. These will afford facilities for the passage of armies to east Asia. China thus will become either the battle-ground of Britain and the United States or the Anglo-American sphere of influence. China is thus destined to become the mistress or slave of England and America, unless Japan, her true friend, shall come to her assistance. It is a mistake to say that Japan acquired rights in Manchuria and Mongolia by aggression. The Russo-Japanese war was a war of self defense against Russian aggression which was endangering the existence of the empire. Japan did not want to occupy Manchuria and Mongolia if she could control them economically. China should recognize this and co-operate with Japan.

If the Japanese fleet is inferior to the American fleet in the coming war in the Pacific, action will be confined to maintaining communications with the Asiatic continent; but if the balance is in Japan's favor, then the struggle will be extended to maintain communications with the rest of the world. The front line of Japan is in Asia as well as on the sea. No strong foreign nation can be allowed to control eastern Asia. Naval officers have suggested that Japanese strategy should be to guard in the north and advance to the south.

The most important lesson of the world war of 1914-1918 is that of the importance of industry in

national defense. Japan cannot wage successful war without development of industries and raw materials on the continent. Even in peacetime the demand for iron in Japan exceeds the supply by 500,000 tons annually. The amount needed must come from China and Siberia. This is also true of coal, wool, cotton, and other raw materials. Aluminum is a material not found in either Japan, China, or Siberia.

"Any number of people may live in Japan as on a ship, if they can get their food supply from elsewhere," so states the General without a qualm as to the ethical aspects of such a declaration, since that is what pirates think. If Japan can maintain her lines of supply on the continent, the growth of population will be no inconvenience. When the center of national defense and industry shifts to the continent, the General proposes to shift the national capitol to Seoul in Korea to give the people of the newly-acquired land the benefit of Japanese civilization.

Japan's mission is then to serve the 600,000,000 people of eastern Asia just as the English and Americans attempt to spread Christianity. So far, Japanese efforts have not been noteworthy in their scope or success in winning support in either Korea or China.

The weakness of Japan's military system is the lack of close relations between the Army, the Navy, and the people. Her lack of industrial power is a severe handicap. The Army takes lessons from France and Germany, the Navy from England, and the people from England and America. Government supervision of industry in time of peace is necessary to a successful industrial mobilization in time of war. There should be an independent department for war materials. The responsibility of developing war industries should rest upon the people as a whole and not upon the Army and Navy. Too much secrecy leads to lack of progress in the development of arms.

The General foresees the decline in the relative efficiency of the dreadnaught through the development of high-angle fire, and air bombing, and urges the development of a surprise attack fleet, but laments the lack of interest in these matters by members of the Diet. In the organization of the Army he favors the training of units in the tactics of surprise attacks by relatively small bodies, assaults, night attacks, and other swift actions.

As the people of Japan are not trained in peace time for organized action like those in England and the United States, the organization of the Japanese civilians for war must be accomplished by militarizing the people and socializing the army. Another defect of the Japanese people is their generally poor physical condition, due to lack of interest in sports and physical culture.

In case of American attacks from the air which the General believes likely, he thinks the Japanese people will be more cool-headed and indifferent than either the English or the Americans. The Japanese are more used to large fires, earthquakes, and other

IF JAPAN AND AMERICA FIGHT

disasters and will be trained to cope with those caused by air attacks. Simple and cheap air machines will be adequate for defense.

The General admits that in a prolonged struggle on the sea with the United States, Japan would be at a disadvantage, due to the practically unlimited resources of her adversary. In this he agrees with Hector Bywater, the British expert. The landing of an American expeditionary force in Japan he believes impracticable, even with the Japanese Navy completely annihilated, due to transport and supply difficulties over 4,500 miles of ocean. America has no nearby bases such as Vladivostock to menace Japan's communications with the continent.

Japan should take advantage of the natural commercial rivalry between the United States and Britain and play one against the other. Education in foreign languages, especially English, should be encouraged. Practically every Japanese schoolboy studies English but the American or Englishman with even an elementary knowledge of Japanese is very rare.

America should return to her original Monroe

Doctrine; England should maintain her present spheres of influence and leave eastern Asia to Japan. The world will then be controlled by the three great powers. Toward the Russians the Japanese have no other ambitions than to help them to develop industry and establish a stable government.

The Chinese have always been very difficult for the Japanese to deal with as they always use petty tricks such as "playing one devil against another." Driving out American influence from China would settle that difficulty and permit the spread of Japanese civilization and the establishment of a stable government with which Japan could cooperate. The Americans, he warns, should remember that "Those who are boastful will not last long."

He urges the Japanese not to allow their quarrel with America to become protracted nor verbal, but that they should appeal to arms and be done with it, without compromise, because America will tend to become stronger and more the master of the powers of nature and science. The geographical impregnability of the Japanese empire will then be overcome and the stainless and perfect empire will fall.

The politics of all the powers are governed by their geography.

—Napoleon.

It Can Happen Here

(Reprinted from the *United States Steel News*)

Is American industry in serious danger of enemy attack?

The answer is yes, and as it becomes more evident that American production will be the decisive factor in the war that danger will grow.

There are two ways in which the enemy may attempt to destroy American plants—through saboteurs stationed in our midst and through air raids.

During the first World War air attack on our country was impossible, and even in Europe bombing of civilian objectives was negligible by present-day standards. The Germans made a total of 103 air attacks on London during World War I, and yet the combined weight of all the bombs they dropped was only about 270 tons. By way of contrast, in a single raid on the Renault automobile plant near Paris the Royal Air Force recently dropped eight

their heavy load of fuel would sharply restrict the number of bombs they could carry, the obvious reply is that they don't have to take off from Europe.

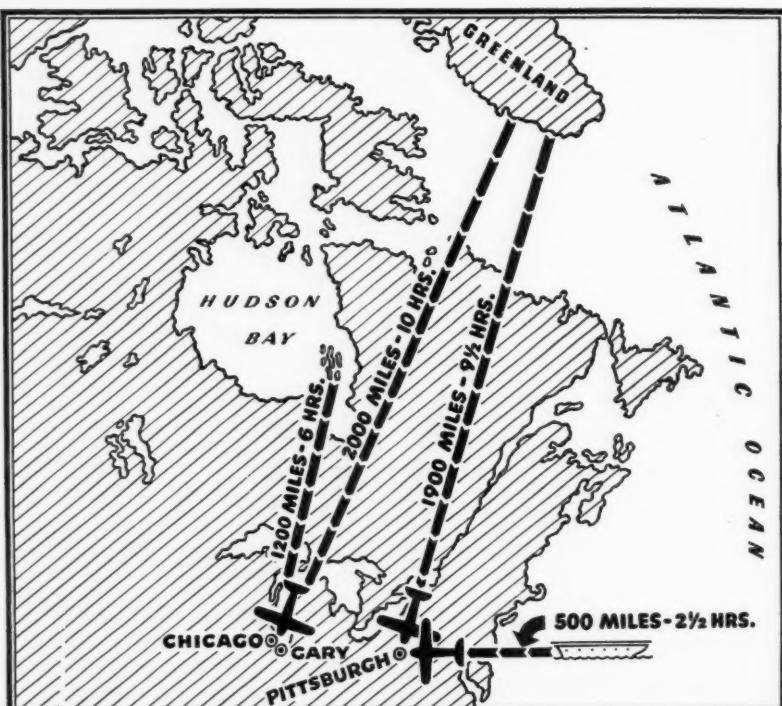
The distance from Hawaii to Japan is roughly the same as that from Pittsburgh to Europe and yet Pearl Harbor was attacked by enemy planes, and Japan in turn was raided by our own air forces. In both cases it is assumed that the attacking planes took off from aircraft carriers. If hostile carriers succeeded in reaching points near our Atlantic Coast, enemy bombers would have a flight of only 500 miles, or less, to reach Pittsburgh.

But the Atlantic Ocean is by no means the only possible source of enemy air raids. There are many points in the sparsely inhabited regions of the northern part of this hemisphere where hostile air bases might be secretly established during the open summer season.

The west coast of Greenland, for instance, is only about 1,900 miles distant by air from Pittsburgh—a flight of about 9½ hours for a heavy bomber—and 2,000 miles from Gary or Chicago—a bombing flight of 10 hours or less. If the enemy penetrated the Hudson Bay territory the flight distance to the Chicago district might be reduced to say 1,200 miles and the flight time to about 6 hours.

These few examples indicate that American industry faces a very real danger and explain why preparations to guard against air raid attacks have been undertaken among all producing subsidiaries of United States Steel Corporation.

In the Carnegie-Illinois Steel Corporation, largest U. S. Steel subsidiary, more than 18,000 employees out of a total enrollment of more than 125,000 are being organized and trained for plant defense. The organization of these forces has been placed under the



U. S. Steel News.

times as much, or over 2,000 tons of bombs.

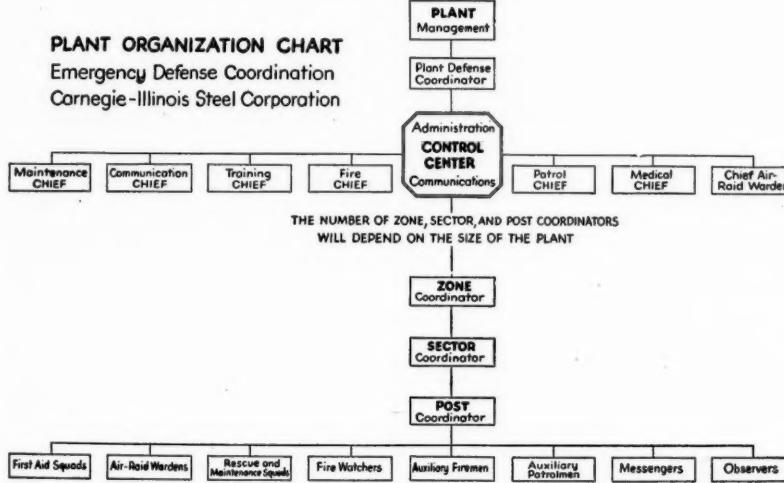
But that raid was in Europe and we, in America, are more than 3,000 miles away. While it is true that distance still makes it difficult for our enemies to reach us, it no longer bars the possibility of air attack. It is well known that the cruising range of bombing planes is far greater today than it was in the first World War. Such aircraft can fly the Atlantic with a load of bombs. To those who point out that they are unlikely to do so because

supervision of Bennett S. Chapple, Jr., assistant to vice president in charge of emergency defense coordination, with headquarters in Pittsburgh. It is also his responsibility to coordinate the plant organization with public authorities and civilian defense agencies.

The training of employees in methods of plant defense is being conducted by the Industrial Relations Department in Pittsburgh, and the training staffs within each plant. This training is based up-

IT CAN HAPPEN HERE

on a series of manuals covering each of the essential emergency functions, and is designed so that each trainee will know how to deal with particular industrial hazards. The training program, like that for civilian defense which it resembles in its broad out-



U. S. Steel News.

lines, provides separate, intensive instruction for specific emergency functions. Each man trained will know exactly what is expected of him and will be ready at all times to perform his duties.

In addition, a sound-slide film, entitled "It Can Happen Here," illustrating the danger of enemy attacks and measures that may be taken to cope with them, has been prepared by the Training Division staff to aid in the more general training of employees whose services are not needed for special emergency duties.

The accompanying chart shows the defense organization of a typical plant. Top responsibility rests with the general superintendent of the works. He may, however, delegate authority to a plant defense coordinator, who is charged with the full responsibility for the organization and the proper functioning of all emergency defense activities throughout the plant.

Reporting directly to the plant defense coordinator are the chiefs of seven service groups as follows: a maintenance chief, a communications chief, a training chief, a fire chief, a plant patrol chief, a medical chief and a chief air raid warden.

The assignments involving the maintenance, training, fire, patrol and medical posts logically fall upon the person in charge of those duties in the regular organization. The patrol chief, for example, continues to have the responsibility of patrolling buildings and grounds, checking individuals in and out of the plant and enforcing rules and regulations, but, in addition, must keep his organization on the alert for acts of espionage and sabotage and, in case of blackout or raid conditions, must prevent theft and looting.

Special assignments are necessary only for communications and for air raid defense. The communications chief is usually the plant electrical engineer, while the chief air raid warden is ordinarily drawn from the plant safety division.

The responsibilities of these seven chiefs fall into two categories: first, those which must be performed prior to the occurrence of an emergency, and second, those to be performed under the stress of actual attack. The most important responsibility in the first category is in connection with the selection and training of employees for their special duties.

Besides being subdivided according to function, the plant defense organization is arranged into zones, sectors and posts. Zone coordinators, report to the plant coordinator through a control center. Sector coordinators, in turn, report to their zone coordinator, and post coordinators to their sector coordinator.

The responsibilities of the zone, sector and post coordinators respectively are carried by division superintendents, department superintendents and general foremen. While the individual department head may elect to assign his responsibilities to one of his immediate associates, the over-all responsibility remains with the operating head so that the authority involved will coincide with the authority already established for controlling regular plant operations.

Reporting to each post coordinator are men chosen from among employees who are trained under the direction of the training chief in the specific functions indicated in the eight parallel services shown at the bottom of the chart. Each has well defined duties, and these, so far as possible, approximate those of similar posts in the civilian defense organization. The titles of these eight basic categories are more or less self-explanatory and indicative of the type of training required.

The relationship of these plant defense workers to their post coordinator, on the one hand, and to the various functional chiefs, on the other, is illustrated by the following example, citing fire watchers and auxiliary firemen only.

In the event of an actual raid, the fire watchers and auxiliary firemen take their appointed places. The fire watcher's immediate responsibility is to handle promptly all small fires originating from incendiary bombs or otherwise, and in doing so he will use the emergency fire-fighting equipment established throughout the plant for this particular purpose. To the auxiliary fireman is assigned the responsibility of handling the larger fire-fighting equipment, such as hose stations, hose carts, trailer

pumps, and fire engines. Unlike the fire watcher, who will immediately cope with any emergency that arises, the auxiliary fireman remains at his post until ordered out by the fire chief.

If all goes well during the course of a raid and the fire watchers are able to keep small fires under control, there is no need for the fire chief to function. However, he will be kept advised of the progress of the attack so that he will have all the facts at his fingertips. On the other hand, should a fire show signs of getting out of hand, then it is the duty of the fire watchers to report their need of aid to the control center through the post, sector and zone co-ordinators. Under these conditions the fire chief will dispatch the necessary equipment.

In peace-time fire fighting it would be the duty of the fire chief to proceed directly to the scene of the fire. Under the emergency conditions with which we are faced, it becomes essential that the fire chief remain at his control post so that he will be in a position to make the necessary decisions with respect to the sending of equipment should more than one

fire in different parts of the plant require attention at the same time.

The fire chief, like the other functional chiefs, has duties that must be performed prior to the occurrence of an actual emergency.

These include assuring an adequate fire alarm system, inspecting the plant for fire hazards and effecting their removal, surveying and inspecting the water supply and making provisions, if necessary, for auxiliary sources, locating an auxiliary fire brigade, determining the location of fire watcher posts and of portable fire-fighting equipment, and directing, with the aid of the training chief, all fire watcher training and all auxiliary fireman training.

This brief outline of the organization for plant defense in the Carnegie-Illinois Steel Corporation indicates that far-reaching precautions are being taken against possible attack by our enemies. There is, of course, no way of telling whether or not the enemy will attack American industry from the air, but, as military experts have pointed out, both Germany and Japan have the necessary equipment for bombing American industrial plants, and it may suit their purposes to attempt such raids.

Japanese Discipline, Confucianist and Feudal

(An extract from *Candide*)

BY
GENERAL DUVAL, French Army.

Since it is said that the Japanese scorn death, would it not be interesting to know how they manage this problem? Permit me, therefore, to relate what I heard when I was with the 6th Japanese Infantry regiment in Nayoga.

Let us begin with a symbolic ceremony. On 1 January, the regimental officers meet in the large hall of the officers' club where, every day, regardless of whether we are married or not, we take breakfast together with the colonel. For in the Japanese army, no matter what the rank or position, one's services are retained throughout the entire day.

So, on the morning of 1 January, we are all there, as on every other day, but in holiday garb. In an adjoining room a sort of altar has been erected. It was completely buried under a profusion of flowers. The portraits of the emperor and empress dominate the altar. Each officer, one at a time, entered the hall. He was entirely alone there. He stopped for a moment in front of the altar, bowed deeply and, before departing, left a branch of the sacred tree on it. There was no speech, nor any word

spoken by the colonel or any one else. Worship of the emperor forms a part of the soul of every Japanese.

During the winter months every week, a professor from a higher institution of learning gives a talk to the officers on philosophy and philology and, at the same time on a book called the "Kokkyo," from the "Great Teachings of Confucius," or the "Book of Filial Piety." In Japan, filial piety is the ideal and natural solution of the problem of discipline. Discipline is born of the family as a result of its triple nature—the father, the mother, and the son. This triple relationship is everywhere emphasized and this permits the defining of the duties and, in a way, the manner in which each of them is to be performed. For example, army regulations concerning interior service teach us that in the regiment the officer is the father, the non-commissioned officer is the mother, and the soldier is the son. In the group of officers, the colonel is defined as the father, the lieutenant-colonel as the mother and the lower officer as the son. Filial piety reaches its supreme expression in the duties of the Japanese with regard to their emperor.

Thus, the doctrines of Confucius which are more than 2,500 years old are not only discussed but practiced. Japanese education is filled with evidences of the desire to practice his ideas. After leaving the controlling influence of the family, the Japanese continue in the school under the guidance of the master who in Japanese is called "sensei," a word which means "he who begets a second time." After the school comes the regiment. There historical and feudal tradition lend powerful support to the doctrine of Confucius.

The Japanese prefers not to talk of all this. He is reticent about divulging his intimate feelings. It may be that he is more this way in the presence of Europeans than of others. Is it because of their inability to understand, or their scepticism? I am sure I do not know. But his military conduct is ruled by these concepts. Since he is rational by nature, he demands that the army provide solid material support to his moral strength; he also asks that this moral strength be tested by fatigue and physical suffering.

Thus are combined the discipline of both the soul and the body, producing a seasoned soldier who is a slave to duty. When this traditional sense of mili-

tary honor is combined with an education along similar lines, there is no need of tying the man to the torpedo to insure his accompanying it to the end of the trip. The torpedoing of the British warships was a difficult job. One torpedo in the side of one of those ships would have sunk it. It required several, striking the ship at the same point and puncturing successive compartments. This required not only great courage of the men taking part, but skill in maneuvering and the sense of cooperation. This cannot be the work of fanatics, but that of units which are perfectly disciplined and trained.

The Japanese Empire has undertaken a job which, regarded from a merely reasonable standpoint, appears immense. She could not reasonably count on superiority of numbers nor on superiority of industrial power. However, she reflected before acting. Those who know Japanese nature, say that it is not given to taking chances. Japan has placed all her confidence in her military valor. Has she made a mistake or not? It is not for me to say. But I shall end as I began, stating that, for the time being, this war has come to be one of moral forces supported by the material forces of modern science, more than just a war of machines directed by the moral courage of a few chosen people.

I can make armored wagons carrying artillery, which shall break through the most serried ranks of the enemy, and so open a safe passage for his infantry.

—Leonardo da Vinci, late fifteenth century.

Selection of the Parachutist

BY

CAPTAIN DAVID E. THOMAS, *Medical Corps, U. S. Army.*
(Reprinted from the *Military Surgeon*)

This article is written with the view of acquainting the medical personnel of the armed forces with just what physical and mental requirements are desirable in parachutists. Many men have reported for training in the past who were not of the right caliber. This has resulted in the expenditure of time, money and effort to no avail. If a man is not qualified mentally and physically, he is liable to injure himself or at some point in his training refuse to continue.

The possibility that eventually there may be many claims against the government for injuries received while parachuting cannot be overlooked. If these injuries are to be held at a minimum, we must have the right type of personnel. The avoidance of injury depends on a man's ability to think fast, to learn the proper technique, and to make his muscles obey his mind. The clumsy, athletically inept person is a liability. The person who permits his fear reactions to make him forget what he has learned cannot be trained successfully.

The injuries sustained by parachutists occur, in most cases, while landing. These injuries generally involve the bones and joints of the lower extremities. While these injuries result from such factors as uneven ground, the presence of fences, stumps or other factors beyond the control of the parachutist occasionally, they generally can be traced to faulty technique or faulty physique on the part of the parachutist. In landing, it is necessary to keep the feet the width of the hips apart and parallel. When about six feet above the ground, the parachutist gives one last, hard downward pull on his harness risers. He should land on the balls of his feet and, if necessary, break the shock by tumbling. Even if properly done a man may injure himself if he has weak arches, ankles, or knees to start with. If a man surrenders to his fear reactions when coming in with an oscillation or a drift, he will brace his feet ahead of his body, take all the shock in his legs and feet, and be very liable to receive a sprain or a fracture.

The physical and medical standards of

the infantry soldier must be modified for the parachutist.

A minimum height of 66 inches and weight of 150 lbs. is desired. While it is true that smaller men can make easier landings, a small man does not have the strength required to handle the heavy loads of equipment. A good, little man is very desirable, but most little men are not good enough. Maximum height and weight are 72 inches and 185 lbs. Tall men have trouble getting out of the plane door and exceptionally heavy men may blow out panels of the parachute during the opening shock. Heavy men descend fast, thereby getting hard landings. Tall, thin men, have difficulty tumbling properly.

A vision of 20/40 uncorrected in each eye is required because a man must be able to gauge his height from the ground accurately when landing and must be able to see equipment bundles after he lands. Satisfactory color differentiation in the yarn test is also necessary because equipment of various types is dropped by means of colored parachutes.

The usual teeth qualifications apply. Men with small bridges are acceptable but if a plate is worn the man is not accepted because of the possibility of his losing or breaking the plate.

A second degree pes planus does not disqualify if there is no eversion and the feet are asymptomatic. A greater degree of deformity is disqualifying for, in our experience, soldiers with third degree pes planus commonly injure their arches and must be dropped from training.

A candidate is required to demonstrate good physical strength, stamina and coordination by his ability to do fifteen push-ups and perform coordination exercises with an acceptable degree of proficiency. In this regard, a history of excellence in some competitive sport is desirable but not required.

It has been shown by experience that old injuries are liable to recur during parachute training. For this reason, individuals giving a history of severe back injury, frequent sprains, unstable knee joints, severe head injuries, or fracture

involving a major joint or producing a deformity in an extremity are disqualified. Also rejected are those revealing evidence of an operation involving a joint.

A persistent blood pressure over 140 systolic and 100 diastolic or a persistent pulse rate over 100 beats per minute are considered to be evidence of vasomotor instability and cause for rejection.

The duties of a parachutist after landing require initiative and individual thinking to an extent beyond that required by the average soldier. For this reason, in addition to the fact that the more intelligent soldier generally makes the technically more proficient parachutist, members of group 1 and 2 in the A.G.O. intelligence test scale are preferred and no one with lower than a group 3 rating is accepted. A high school education or its equivalent is required.

Additional causes for rejection are a history of fainting at the sight of blood or after minor degrees of overexertion, epilepsy, migraine, or similar nervous diseases. The reason for these standards is obvious.

Concerning emotional qualities desired, we are not at present in a position to establish fixed standards. Of course, gross evidence of emotional instability and failure to adapt to his army environment disqualify a candidate, but past this point one cannot go.

It has been our experience that we are liable to encounter refusals among the stoical, phlegmatic type of individuals as well as among the nervous, more volatile types. It would seem at the present time that a study of the soldier's mental attitude on arrival, including his reasons for volunteering for parachute duty and whether he knows in his own mind that he will be able to voluntarily jump out of an airplane in flight or just wishes to find out if he has the necessary amount of intestinal fortitude, correlated with a study of soldiers who refuse, will reveal the answer to the problem. This study has been initiated by medical officers who are themselves qualified parachutists and intimately acquainted with the mental and psychic factors involved.

Foreign Military Digests

Digests of articles from foreign military periodicals; other items of interest from foreign publications are summarized in the Catalog of Selected Periodical Articles.

The German Light Infantry Division

[An article by Colonel E. Aleshin, Russian Army. Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the article "Nemetskaya Pekhotnaya Divizya Oblegchonnoye Tipa," in *Krasnaya Zvezda* 26 May 1942.]

Huge losses in personnel and materiel have forced the Germans, even in the fall of last year, to reorganize certain of their divisions to contain two regiments. During the winter period, when, as a result of Red Army's counter-offensive the German forces were feeling a dire need of reserves, the number of such "anaemic" divisions at the front noticeably increased.

Among new formations of German infantry, moved to the fighting front as spring-summer reserves, these light divisions are also encountered. One of these divisions, committed by the Germans, was defeated by us during its early days in combat and was retired to the rear for replacement. A number of documents captured enables us to analyze this new German light division.

It consists of three infantry and artillery regiments and a signal company. Compared with earlier units the division is considerably smaller in personnel and in quantity of materiel. A definite picture of the basic weapons equipment of the new German infantry division is gained from the table below.

| Designation of Materiel | Organic Composition of Division | | |
|----------------------------------|---------------------------------|-----------------|------|
| | Normal | Light Reduction | Type |
| Heavy 105-mm howitzers type "18" | 12 | 2 | 10 |
| Light howitzer type "16" | 86 | 24 | 12 |
| 75-mm field guns | 18 | — | 18 |
| 50-mm AT guns | — | 6 | — |
| 37-mm AT guns | 72 | 30 | 42 |
| Heavy and medium trench mortars | 64 | 18 | 36 |
| Light trench mortars | 81 | 54 | 27 |
| Machine guns | 108 | 72 | 36 |
| Portable machine guns | 324 | 216 | 108 |
| Antitank rifles | 81 | 54 | 27 |
| Machine pistols | 432 | 288 | 144 |

The reconnaissance detachment and pioneer battalion have been left out from the organic composition of the light division. In place of the signal battalion one company has been left, consisting of three platoons, each of a different specialty. Divisional rear installations have been reduced to about one-third. Instead of two field hospitals the new organization provides for only one. Almost the entire complement of rear installations of the division and the individual units consists of carts of the type of year 1895 and of peasant carts.

The division, regiments and battalions do not have special units for antiaircraft defense. There also are no divisional antitank defense organizations, while the regimental ones have been considerably reduced.

The newly formed infantry regiments consist of two battalions. All third battalions, infantry gun companies, and trench mortar platoons of the battalion machine-gun companies have been left out from the organic composition. The regiment includes: headquarters, signal platoon, two infantry battalions, antitank gun company, pioneer company and horse-mechanized reconnaissance troop. A trench mortar platoon, consisting of six medium and heavy mortars, is given to the regimental commander in place of regimental artillery. The reconnaissance troop, pioneer company and trench mortar platoon are included in the organic composition of infantry regiments at the cost of abolishing the reconnaissance detachment, the divisional pioneer battalion and the trench mortar platoons of infantry battalions.

The infantry battalion has headquarters, signal platoon, three infantry and one machine-gun companies. Thus, the battalion commander has been deprived of his own mortar means.

The artillery regiment of the division consists of two light howitzer horse drawn battalions (six four-gun batteries) and one heavy howitzer battery (two guns with prime movers).

The new organization provides for the reduction of motorization of the division. The following motorized equipment remains: prime movers for the two heavy howitzers from the artillery regiment, prime movers for the regimental 50-mm antitank guns, and motor vehicles of the divisional medical and transport platoons. There is left to the regimental headquarters one passenger car and one motorcycle. One motorcycle remains in the battery. There is not a single car nor motorcycle either in infantry companies nor in the regimental signal platoon. Rear installations are mostly horse drawn. The bicycle is the principal mechanical means of locomotion. The divisional organization provides up to 300 bicycles.

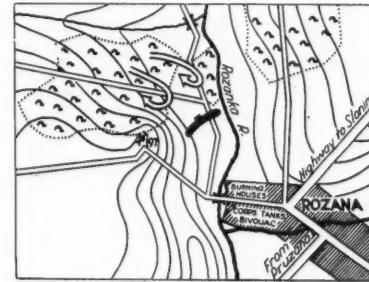
Battle for a Highway on the Eastern Front

[An article by Lieutenant Fritz which appeared in *Militär-Wochenblatt* 15 May 1942. Translated from the German at the Command and General Staff School, Fort Leavenworth, Kansas.]

"R-2" is the route followed by our tank divisions, also the supply route. Over it the columns roll ceaselessly on to the East, like an endless belt.

Our division was far to the front. It was the job of the divisional supply column commander above all, to keep the combat units supplied with fuel.

After a period spent in the discharge of this first assignment, the order arrived: "K's column immediately fill up at the fuel depot at Rozana. After taking on fuel, get ready to move on 'R-2' with the point 1 kilometer to the northeast of R... Report immediately, when ready." The gas tanks were in the city, not far from the highway. In the northwest part of R... many houses were still on fire as a result of attacks of the night before by Russian guerrillas. These attacks had been repulsed, however, with the help of as many of our men as could be spared from the supply column. Motor vehicles were now crowded in the square of the city and on the roads. All were anxious to start as soon as possible.



Scarcely had we started taking on fuel when again the sound of rifle and machine-gun fire was heard coming from the northwest part of the city. A soldier arriving from the scene of the disorder, reports that the Russians are advancing against Rozana, that our securing forces are too weak and that reinforcements are urgently needed. I immediately gathered together all the available noncommissioned officers and men, about 120 of them, and stationed them on a rise northwest of the city, which offered a good field of fire.

Nothing could be seen of the Russians as yet. They were still in a woods to the northwest of us which was traversed by a road which ran through it in an east-west direction. This forest road opened onto the highway which came down from the north and entered Rozana on the west side and which we had taken in our march.

My own survey, complemented by the statements of the commander of the small security detachment, gave the following picture: our highway was the easiest route for the Russians for their advance and attack of Rozana. My decision: the barring of this highway to the south in order to cut off the road for the enemy.

By taking advantage of the terrain, it was possible for me to bring my men to a point not over 400 meters from the highway, without drawing much fire from the enemy. We had scarcely had time to take our positions on both sides of the highway, however, when the Russians attempted to advance by the use of trucks. But they did not get very far; their

MILITARY REVIEW

plans were wrecked in the combined machine-gun and rifle fire of my supply column troops. They abandoned their trucks where they were, and fled to the woods. An enemy machine gun on the edge of the woods which was keeping our positions under fire in an effort to cover the advance of the Russians, was also silenced.

But it was not long till the Russians, this time without their trucks but about a company of them in strength, attempted to attack us again, advancing down both sides of the highway which had been blocked by us. This time the attack was supported by machine-gun and mortar fire. But this attempt also failed under the defense fire of my supply column men aided by the fire of an antiaircraft gun which in the meantime had been pulled to the top of Hill 197 to the west of us.

West of Hill 197 new reinforcements had joined the small security detachments, and these defeated the Russians who attempted to attack them. From this place I received the report that Russian tanks had been seen approaching our area. The report was quickly confirmed by the sound of cannon and the explosion of several shells which certainly ap-

peared to come from tanks. This made the situation more critical for us, as we had no armor piercing weapons.

"Get ready with hand grenades and concentrated charges," I commanded as I closely watched every movement in the woods opposite us. Suddenly there appeared, as if ordered, (probably however, they had been called by the radio troops of the communications outfit to the left of us), three Stuka dive bombers which circled, then loosed their bombs in a hawk-like dive. Again and again they plunged toward the earth. The effects of the explosions could be imagined by the heavy roars and clouds of smoke. Unfortunately, from our positions we were unable to recognize any of the effects of the Stuka attack. But I was able to see that the Russians who had collected in the woods turned and ran, and we after them.

The woods were mopped up. Only a few of the Russians escaped. The enemy tanks were disabled.

I led the men back toward Rozana, We now set about the completion of our real task—taking on motor fuel. Two hours later the loaded column rolled eastward with fuel for our tanks.

Japanese Principles of Antitank Defense

[An article from *Die Panzertruppe* June 1940. Translated from the German in the office of the Chief of Engineers, Washington, D.C.]

The purpose of antitank defense is to neutralize or destroy the hostile tanks by taking every possible advantage of their shortcomings.

The inherent disadvantages of tanks are as follows:

Tanks depend upon the conformation of the ground and are incapable of surmounting powerful natural or artificial obstacles.

Weather conditions affect the performance of the engines.

Working conditions of the tank crews are unfavorable; observation is difficult; and the fire of tank weapons is inaccurate.

Tanks on the march occupy long columns and are difficult to camouflage.

Reconnaissance and communication play an important role in antitank defense. An early and clear picture of the hostile intentions must be established; and information must be transmitted without delay. Commanders of all grades must give attention first and foremost to all reports on the activities of hostile tanks.

The infantry must bear in mind that calm nerves are all-important while a hostile tank attack is in progress. If the infantry is carefully camouflaged and concealed, the tanks might fail to notice it, thus permitting the infantry to proceed with the execution of its mission. The infantry must be able to recognize the weak points of the opposing tanks as quickly as possible and independently commit to action its antitank weapons.

The antitank weapons of the infantry include antitank guns, accompanying guns and mortars. At short range, light and heavy machine guns and rifles also may be of good effect against the eye slits of tanks. Mines and so-called "Tank fighters," that is, men with special training and equipment for direct assaults on tanks, constitute further and most effective means of antitank defense. Finally, raids executed by foot troops

may be quite successful against certain types of tanks and under favorable conditions.

Observation and reconnaissance are vital factors in the establishment of security against tanks. The observers must see to it that hostile tanks will not succeed in carrying a surprise attack. Taking full advantage of the cover of the ground, the observers must be posted so that they can recognize the approach of hostile tanks early enough to permit the antitank weapons to open effective fire at 1,000 yards. The speed of the tanks and the time required for the transmission of the message must be taken into consideration in the selection of observation posts. The minimum distance may be calculated with the aid of the following formula:

$$D = [300 \times (T_0 + T_g)] + 1,000$$

D — Minimum distance between observation post and firing point;
 300 — Speed of tank in yards per minute;
 T₀ — Time required for transmission of observer's message (in minutes);
 T_g — Time required for gun to open aimed fire (in minutes);
 1000 — Range (in yards).

Where the ground is unsuitable for the establishment of observation posts, with the requisite field of vision, mobile observers equipped with means of signal communications are advanced.

The distance at which a tank can be recognized depends upon the weather as well as the conformation and cover of the ground. While, in clear weather it is possible to observe a medium tank through a binocular at approximately 4,500 yards and with the naked eye around 1,500 yards, in murky weather a tank is visible only up to 1,200 yards. At night, the ear replaces the eye. Tests have shown that, in calm weather and on level ground, the noise of a tank travelling at normal speed can be heard at between 1,500 and 2,000 yards; whereas the sound of a throttled motor is audible only up to 300 or 400 yards. It

must be noted, however, that tanks cannot be heard if the opponent drowns out their noise by that of artillery fire or aircraft.

Although rifle and machine gun ammunition is not powerful enough to penetrate the armor of tanks, the operations at Shanghai, for instance, demonstrated that these weapons may be effective against tank crews, when aimed at the eye slits of the tanks. However, this presupposes the concentrated fire of at least a section for every tank.

The infantry must know how to attack a tank. The best method is the surprise assault carried out, for instance, when the conformation of the ground forces the tank to travel slow. This raid on the tank may take place either before or after the antitank fire has been delivered; at any rate, the infantry must take care not to interfere with the action of the antitank guns.

Every rifle company includes a section of special "tank fighters." This section consists of five pairs of two tank fighters each. Machine gun companies and heavy weapons units organize similar, though smaller, detachments for that purpose. If necessary, the tank fighter section of the battalion may be combined and placed at the immediate disposal of the battalion commander. These tank fighter sections are specially equipped for action against tanks. Each man is armed with an antitank mine, a bomb and a smoke hand grenade, or some other means of blinding the tank crew.

The assault by antitank mine or bomb may be executed in three ways:

(1) The tank fighter crawls toward the tank under cover, until he is within the dead space of the tank weapons. Next, he throws the mine, which is attached to a long string, about fifteen feet in front of the tank and, by means of the string, pulls it directly under the track.

(2) Several pairs of tank fighters move forward under cover and place a number of mines in front of the tank in such a manner that the tank must drive over one of them.

(3) A number of mines are fastened, a foot apart, to a 150-foot line. Two men conceal themselves with this chain of mines and draw the mines across the path of the tank at it approaches.

All of these methods presuppose an accurate knowledge of the hostile tanks especially of their dead spaces.

Smoke, lime, mud and so forth may be used to interfere temporarily with the operations of a tank. A smoke hand grenade, from which an equally heavy weight is suspended by a cord, is hurled against the gun barrels or antenna of the tank. The cord will wrap itself around one of these objects and cause the smoke cloud to follow the movements of the tank. Paper bags filled with lime or mud may be thrown at the eye slits, in order to close them or blind the crew. Tank fighters must be trained for this kind of action until they are able to score consistent hits at ten yards.

If none of the above-mentioned measures are of any avail, the tank fighters must attack the tank directly, by jumping on top of the tank—usually from the rear—and damaging the guns or rotating mechanism of the turret with picks. The pistol may be used to fire on the crew through openings in the tank. Another method is to blind the tank crew by throwing a shelter half over the turret to smoke it out. Naturally, all of these forms of assault are feasible only

FOREIGN MILITARY DIGESTS

if the friendly infantry can neutralize the hostile infantry accompanying the tanks. Tanks have been delayed and stopped, finally, by driving three-inch wooden poles or one to one-and-a-half-inch iron rods between the spokes of the track wheels.

Example for the Antitank Defense of a Rifle Company

Situation: A rifle company (with heavy machine gun section), reinforced by a tank fighter section and an antitank gun, constitutes the advance guard and moves out in deployed formation.

The functions of *reconnaissance and security* are assigned to the tank fighter section. Using prearranged signals and runners, the tank fighter section informs the elements in its immediate rear of the approach of hostile tanks and their number and type.

Antitank Defense Means: In addition to the tank fighter section placed at its disposal by the battalion, the rifle company has its own tank fighter section. Two pairs each of this section accompany the rifle platoons of the second echelon. The antitank gun follows behind the security elements. The heavy machine gun section marches some distance in rear of the antitank gun. All of these weapons as well as the light machine guns of the rifle platoons are held in readiness for immediate action.

Tank Alarm: By means of visual signals, the security elements on the right

flank announce that "hostile tanks are attacking from the right" and give their strength. The company observers immediately relay the information to the company commander. The antitank gun, the heavy machine gun section and the two light machine gun sections of the right platoon go into position instantly and open fire as soon as the tanks are within effective range. While retaining two pairs of tank fighters in reserve, the company commander directs the other tank fighters of the security detachment to attack the tanks. The commander of the right platoon issues the same orders to his tank fighters. The commander of the left platoon places his tank fighters on the right flank of his platoon.

The tank fighters that have been ordered to attack advance by bounds from cover to cover, careful not to interfere with the fire of the antitank gun and machine guns. Each pair of tank fighters throws one or two smoke hand grenades about 100 yards in front of the tanks, thus forcing the tanks to drive slow, while enabling themselves to close in on the tanks.

Meanwhile, the company commander shifts his company to the left, in order to avoid the fire of the tanks, and resumes the execution of his mission. If any tank should succeed in getting near the company, the tank fighter reserve then goes into action and attacks the tank or tanks in a similar fashion.

The Retreat from Libya

[An article by Alan Moorehead in *Fighting Forces* (British) August 1942.]

Two articles on our retreat from Libya appeared in the "Daily Express" on 23d and 24th of June. They were written by Mr. Alan Moorehead, "Daily Express" War Reporter, who is generally regarded as the best of our war correspondents in the Near East. They seemed to us to be so admirably sound, so packed with good advise, that we asked permission of the "Daily Express" to republish them in this Journal, permission which was very kindly granted.

The two articles appear below.
—THE EDITOR.

I.—QUICK DECISION MEN NEEDED. —Cairo, 22d June.

These, in my judgment are the reasons for our retreat:

EQUIPMENT

The Germans still have:

The better all-purpose gun—88-mm.
The better tank—the Mark Four.
The better plane—The Me. 109.

Our answers to these weapons in order are:

The 25-pounder gun, which is not mobile enough, and is too heavy for all purposes; and the Befors, which is too light.

The American Grant tank, which has vulnerable spots and is too slow.

The Kittyhawk fighter, which also is not fast enough.

Supply

1. It takes the enemy roughly one month to replace a tank or furnish a new one; and us roughly six months.

2. The enemy have a few simple standardized types in tanks, aircraft and guns, which means that they have got to carry only a few types of spares. We have got many types, requiring many different types of spares.

Often we get spares in the wrong places because of this multiplicity—I have seen tank workshops where for lack of spares one of the damaged tanks has got to be pulled to pieces to furnish spares for the other tanks. That sort of thing takes a long time.

3. Allied supplies, badly needed here, have been scattered over the world, to the Far East, India, Australia or Madagascar, or kept in England.

Tactics

1. The Germans always mass their fire power. They seldom split their armour. They do not go out on minor raids—they rest their forces, and then throw them in all together. That goes for the Luftwaffe, too.

Thus, in the last three days, they did not split their armour, sending one branch to the frontier and another to Tobruk. They massed their armour on El Duda and rested their air force. Then both arms went in together. This system does not always succeed, but it has succeeded this time, and our system of decentralization has not.

2. The Germans do not send infantry out into the open unfortified desert while there is enemy armour knocking about.

They either send infantry out with armour on swift attack, digging it into a fortified position, or retire it clean out of the battlefield while the tanks are fighting.

Training

1. They have got more training than we have—longer training, dating away back before the war; more intense training and more technical training.

Men in the Afrika Korps went to a special desert school in Germany before they came out to Africa. It is no good fighting tank battles on Salisbury Plain, and sending tank crews out here expecting them to acclimatize themselves to the desert in a few weeks—it is not fair to them.

There are roads, hills, towns and landmarks in Europe. Here it is open desert, and much of your travelling is done on the compass.

If a tank runs out of petrol or breaks a tread, the commander cannot just telephone for assistance or pull his tank into the side of the road, or walk back to the nearest village.

He has got to find a dot on the map where the nearest workshop and supply center is, take a compass bearing on it, and somehow get there.

It is not easy. Often when he arrives he finds the workshop or dump has been moved on. That means taking another compass bearing.

2. Because they have plenty of technicians the Germans never have to place the infantry commanders in charge of armour or vice versa.

Many of our best desert commanders were not in this campaign. General Blamey was in Australia; General Morshead, last year's defender of Tobruk, was in another sphere. Jock Campbell, dead; O'Connor, captured; Wilson and Freyberg, in another front; de Villiers, in South Africa.

We had a real lack of trained officers about the rank of colonel and brigadier, and that is the rank that is beginning to tell more and more in the desert. They are the men who are most directly responsible for morale and quick decisions at the front.

We would have more experienced men if we had a better system of continually sending large numbers of desert fighters and staffs back to England and replacing them here with men from England.

The system could be staggered. This goes for noncommissioned ranks and factory technicians as well.

I will bet that a large number of mechanics working in English factories would like a spell working in the desert factories out here.

Psychology

1. There is still a fatal tendency, especially among junior British officers to under-rate the enemy.

I meet many young lads who simply do not know the meaning of fear, and it tends to make them a bit over-confident in dealing with so mechanically thorough an enemy as the young Nazi.

They despise the Nazis, and the Italians, and inevitably it makes them think the enemy is not as good as he is.

Allied to this is the feeling that you have only got to be brave to be better and win. The Greeks, all honor to them, thought that, too. But it will not work in a war of machines.

2. The young Nazi is a near fanatic, and a desperate one, too, sometimes. He really believes he is fighting for the Right, and Hitler is "God." His companions all think the same way.

They give confidence to one another by clinging with desperate conviction to their beliefs. It makes them tough, so long as the battle is going their way. They react intensely to victory. They are

MILITARY REVIEW

beginning to believe they cannot be beaten.

Other Points

Our army tends to weight and thoroughness; the enemy's to streamlining.

They eat simpler things, and are ready to throw away all comforts while the battle is on, and then to return to luxury. We spread our comforts out more evenly.

It is utterly wrong and malicious to suggest this time that the R. A. F. and the Army have failed to cooperate.

The R. A. F. have taken many of their losses these last three weeks because they chose to ground-strafe and bomb in support of the Army, instead of going after the German fighters. Time and again they gave up good targets in order to help the Army out from a tough spot, as at Bir Hakeim.

Again, don't think all our generals are bad. It is usually the system you should attack.

There are still numbers of men like Lieutenant-General Gott. Admittedly there is a tendency in the desert Army to say: "It's all right—Gott's there. Gott, remember, up to date had had command of only one corps and one section. But I can report that that great general is still in a vital part of the line.

All these are my own views, and possibly they will cause resentment and dispute on points of fact. I write them because they are points which first strike the onlookers in this campaign.

There are whole units of men and blocks of equipment in the British Army which are an exception in what I have said. But I can only write here of the major issues.

II.—TOBRUK

Let me quote a more official viewpoint than those I have previously expressed about our defeat in the desert—it is one that might strike a veteran soldier of the desert. And I have tried to note what follows as carefully as my own views. They agree in part.

First, then, it is stressed that it would need a much larger force of armour than either side has possessed yet to dominate the North African coast from Cairo to Tunis. So the result has been a seesaw—with the balance somewhere round the Gazala line. The outcome of the battles has had little to do with courage. In the end the side with the more mobile force runs rings round the other side. This always prevails where the spaces are much larger than the armies can fill.

If the enemy is more numerous you try to beat him up, and if you cannot do that you get out—quick.

After enemy armour has been smashed, it is largely a matter of motoring across his territory. This has happened half a dozen times either way now.

Graziani was the only general manning the seesaw, and he hit the ground hard. He did not run away fast enough, so he lost 210,000 men, against about 1,000 casualties on our side.

It is emphasized also that the belief grew up out of that first campaign that the Italian was a poor soldier. That belief has not been borne out since then.

Rommel—and the British generals here insist that he is only an average German general—nearly cut us off last year, but we got into Tobruk in time and held him off.

Defense Required Enormous Force

Tobruk was never attacked during its siege with the same intensity as it was last Saturday.

The outer perimeter is 27½ miles in length, and it was never, experts insist, conducive to defense, except by an enormous force—a force at least three or four times stronger than any that has manned it.

In his present attack Rommel has probably accomplished what he intended to do last November when we attacked him first and threw his plans out of gear. Rommel did then, when his armour was defeated at Sidi Rezegh, exactly what we are doing now—he got out at speed.

He ran straight through to El Aghela.

When he rebounded, mopping up the light British screen, we retired to the Gazala line and fortified it for two main reasons—first, because it covered Tobruk, and second because it was a convenient jumping-off place for any offensives we might plan in the future.

6-Pounder Gun Arrived Too Late

Next there is this point about equipment. It is admitted that the Germans had a larger force, better tanks than ours, and more and better antitank artillery, especially the 88-mm gun, which is a heavier piece than our new 6-pounder antitank gun.

Mark Three and Mark Four tanks have better armour than our tanks—it is a face-hardening process that the Germans have perfected since the last war—and it is very hard to get near enough with our 2-pounder gun to penetrate it.

Our 6-pounder gun had not arrived in time to enable its crews to become adequately used to it, and, in any event, we had not, at the time Rommel joined battle, enough of them.

Our tanks again were not heavily enough armed. We had something better than the 2-pounder this time, but there were not enough American Grants. One hundred and fifty more of them would have conclusively turned the tide.

The vital moment in the battle, it has now become clear, was after the first two days, when we decisively flung Rommel back after his first rush at Tobruk.

There was a period of 48 hours or more when he was definitely undecided.

That was the moment when British infantry and artillery might have rushed in, occupied the battlefield, salvaged or blown up any damaged Nazi tanks, and harried the Germans out of their Cauldron west of Knightsbridge.

They would not have had time to re-group or mount artillery, and might have been forced to make complete retirement back to their original position before they could destroy our minefields.

Rommel's Speed Tactics

The answer to this is that British armour took heavy losses in fighting the Germans off in those first two days, and they were in no condition to pursue.

There were not then sufficient other forces at General Ritchie's disposal to rush forward. He would have badly exposed his flank and rear, in addition to having nothing in reserve.

Rommel then, with his compact and still well-equipped Afrika Korps, had time to repair many tanks—at least 100 of them—to root up the British mines to his north and south, and to bring more forces in.

With desperate speed he shepherded his temporarily breathless force behind the lines of antitank guns. He had a huge number of these guns. They kept right up with the tanks.

Arriving too late, three separate British tank and infantry counter-attacks were broken on those guns.

Heavy Losses—Then the Climax

Revived, rested and replenished, Rommel returned to the attack on his original plan of a week ago.

The sequence was, as you will remember, Bir Hakeim, Acroma, El Adem, El Duda, and then on Saturday and Sunday, the attack on Tobruk.

Before Rommel launched his final attack we had taken, in addition to our first tank losses, the loss of the best part of three infantry brigades, as well as one infantry tank brigade, a small Indian motorized brigade, and some of the Free French garrison of Bir Hakeim.

This left serious holes in our general defense.

Then came the climax. The panzers and what was left of the British armoured brigades met in their last great clash, south of Acroma.

At the height of that battle the main force of British tanks, whether from ignorance or misconception, ran straight on to a bank of German 88-mm guns. This action was decisive.

The old law of the desert prevailed—infantry is a liability once your armour has gone.

Acroma Heroes Saved Many Troops

It was British armour's last supreme effort when they were ordered out to hold Acroma long enough for the South Africans to escape down the coast road.

We were determined not to recommit that fatal error of Rommel's six months ago, when he abandoned 12,000 of his men in the Halfaya Pass positions.

The holding of Acroma was, perhaps, the one occasion in these armoured battles when courage was more important than machines, for the Germans were tired, and it was just a question of who could stick it longest.

But when the last South African was through, it was finish for our front line fighting armour.

Full Might of Fresh Panzers

It is claimed that an infantry line cannot be held in the desert unless both ends are based on some obstacle like the sea, so that neither flank can be turned. We certainly at this stage enjoyed no such advantage.

And so what is called in Army slang "the motoring" began.

Some troops were ordered into Tobruk, others made straight off towards the frontier.

Tobruk, so hastily manned, was in no condition to withstand determined attack, let alone an attack that involved the full might of the panzer armour and fresh Italian and German infantry.

At this stage of every seesaw in the desert, front-line commanders have got to take a pretty quick decision to clear out. Otherwise vital men in the rear like tank fitters and R. A. F. ground staffs, will get swept up.

A good part of these technicians and their equipment we got away. Others, unavoidably, were trapped in Tobruk.

In retreating or advancing, Rommel got a certain advantage in that a good part of his supply was brought by air.

Are We Yet Professionals?

There are a number of other general comments which are not necessarily mine.

It is suggested that we are not yet a sufficiently professional army. We are more like enthusiastic amateurs in some departments.

The Germans are strict professionals, very highly trained to this sort of war, and very strongly disciplined.

They evolve a simple plan, like bunching their armours together and keeping it together whatever happens.

That is harder than it sounds when the enemy is continually trying to drive wedges through your formations.

Tank crews are likely to become efficient in their tanks before a squadron leader is efficient at the bigger problem of handling his squadron. Similarly, a squadron leader is likely to become efficient more rapidly than a tank brigade commander.

The suggestion here is that our tank crews are an equal match for the Ger-

mans, but our commanders need more experience.

Time and again we fouled those anti-tank guns which the Germans always meticulously place on their flanks.

Serious Reverse, But Not the End

Now you can expect fighting on the Egyptian frontier. This is a bad time for our Middle East. Not so bad as the fall of Greece and Crete, but still one of our most serious reverses.

If, however, you think this means the end of the English Army, then you don't know the desert.

we must travel along this road much faster and much quicker.

The recent outcry in Trades Union circles against income tax is symptomatic—an outcry by men whose gross income is double and treble as much as that of the soldier and his dependents. Moreover, we all know of offenders in a greater or lesser measure against the many restrictions that are necessary in time of war, and the worst feature is that there is little wholesale condemnation of such practices by public opinion. We shall never get the right outlook towards vital issues in the soldier until the nation at large purges itself of the many abuses. There must be far more drastic measures against black markets, food profiteers, petrol scroungers and the like. If such offenses were regarded as high treason and a few death penalties inflicted in grave cases, there would quickly be an abatement of the many scandals. Sir Stafford Cripps, who knows the Russian system so well, has complained vigorously about the lack of urgency in our national outlook; he emphasizes that we shall only achieve victory if we devote one hundred per cent of our energy to the nation's war effort.

In the field of national propaganda there is room for vast improvement. The picture is so much more effective than the written word; even in an officers' mess one has only to compare the crumpled condition of *The Daily Mirror* and *The Daily Sketch* early in the day, with the unsullied state of *The Times* and *The Telegraph* late at night to appreciate this. The Russian comic-strip posters, with laconic verses of an explosive wit and violence, are admirable. Everything is concentrated upon satire and upon exposing and deriding the enemy. The workers in the factory and the soldiers and guerrillas in the fields are encouraged to redouble their efforts to smash the enemy and to win the war. Contrast this with our passive and anaemic slogans such as "Your courage and your steadfastness will bring us victory" and "We can take it!" The Ministry of Works is getting nearer the mark with their "Will the Beast invade?" pictorial posters, and of our newspapers, the *Daily Express* is the most realistic in its outlook, and of the weeklies, the *Picture Post*, with such illustrations as those of Japanese troops bayonetting live Chinese prisoners. It is significant that these pictures produced the very next week a torrent of objections on the score of bad taste, and on the ground that it was desirable to keep people in ignorance of Japanese barbarism!

In the cinemas, the Ministry of Information films are fairly good, but broadcasting at home has little propaganda value. To the ordinary man the long Parliamentary broadcasts during the news-hour when the House is sitting, are maddening—the same House of Commons, be it remembered, that echoed with tumultuous applause at the Munich settlement that was to give "peace in our time." Our broadcasting must be less defensive, more realistic, and above all absolutely truthful. The war commentaries of such men as Air-Commodore Goddard and Group-Captain Helmore are on the right lines.

In our contacts with the soldier there are certain fundamentals that we must always bear in mind:—

(1) The only propaganda that the British must use is the truth, and we must be meticulously careful of this.

(2) We must have our own "revolutionary" ideals to set up against the basi-

Propaganda and the Soldier

[An article appearing in the *Royal Engineers Journal* (British) June 1942, written by "Octuple."]

Much ink and paper have no doubt been spent both within and outside the Services on the subject of propaganda. Lip-service in abundance is paid to its importance, and all officers are enjoined to pay it the utmost regard.

We all know that the will of a nation is rarely overcome by force of arms alone, and it is the task of propaganda to attack the portions of the enemy front that cannot be approached by the armed services. The German rarely attacks with military force until propaganda has played its part in weakening resistance. When this has not been done, as in the case of Russia, their army's success has been far from complete.

Few will be prepared to deny that the part played by British propaganda in the present war, whether at home or abroad, has been, to say the least, disappointing; the reasons for this as seen by a humble regimental soldier may not be out of place, even though no novel idea or new principle is propounded.

We can never afford to neglect the lessons to be learned from the enemy, and indeed from our own allies, and both Germans and Russians can teach us much in this, as in many other matters. It seems probable that Hitler and his advisers copied much of the art of impressing crowds and dominating nations from Napoleon. The resemblance between the two is sometimes startling—"Holland is French" quoth Napoleon in 1813. "No power on earth can take it away again." Holland was no longer French 2 years later!

As was pointed out in a recent article in the Army Quarterly, both paid scant regard either to truth or to consistency. Napoleon achieved much success in his use of the revolutionary enthusiasm of France as a weapon and, as with the Nazis, French enthusiasm steadily declined after he had started on his scheme for the conquest of Europe; it is significant that in Napoleon's Russian adventure less than half of his Grand Army was made up of Frenchmen.

Hitler has many resources for the spread of propaganda that were not available to Napoleon, but he has used the same technique. Right from the start he has appealed to two instincts—the sense of grievance and the sense of danger. Together with these he has used a fresh theme of his own—the value of race and blood in an alleged new concept of life. The German is taught that he is fighting in a noble crusade for the conquest of the world by a so-called super-race, and for the overthrow of privilege and plutocratic world control.

It is certain that we shall never get far with British propaganda on such fantastic lines but it is equally true that we must have a master idea, and revolutionary seed to sow in the minds of the nation in general and of our own soldiers in particular. The principles of the Atlantic Charter are all very well, but we want something less verbose and more concise. President Roosevelt was perhaps nearer the mark in the four war aims that he gave to the U.S.A. in a famous speech. These were (1) freedom of thought and speech, (2) religious freedom, (3) economic security, and (4) freedom from the fear of war. These can also be cited as the positive aims of the British peoples, but we have had religious freedom for so long that this has come to be taken for granted, and many thoughtful men would add equality of opportunity as another important objective. But the sense of fear is the main cause of the plight in which the world finds itself today. It is the need for security that is so vital, nor can there be security for any power, great or small unless it is a security in which one and all have equal share.

Few will deny that democracy as practiced in this country, and still more so in the U.S.A., stresses freedom to the utmost, but in practice it is mainly freedom for pleasure and comfort. Our politicians were always insistent that we must lose none of our social gains—their defense was hardly considered! Moreover, democracy in its present form is far too slow and too unwieldy. Lord Baldwin, when Prime Minister, in a moment of unusual frankness, virtually admitted this as an excuse for his own disregard for advising more rapid rearmament.

We are hampered on every side in the Services because our recruits join us saturated with "safety first" ideas and knowing little of the ideals for which they are required to fight. They want to win the war, but they want to lose as little as possible of comfort and convenience in doing so. A commanding officer has only to compare the money subscribed to his unit savings scheme with that spent on beer and tobacco in the various canteens to appreciate this.

The Germans and the Russians fully appreciate the importance of propaganda among the young, and we shall never get far with our own propaganda in the Army unless the right outlook is instilled into the nation at large, at an early age. Something is being attempted in registering youths at 17 and attending to their early training in such admirable organizations as the Air Training Corps, but

MILITARY REVIEW

tard faith of the Nazis. Hence the importance of cleansing our own national life of its worst features. We must stress the necessity for the clearance of slums, the purge of ugliness and the end of exploitation in the reconstruction after the war. We want a Pilgrim's Progress up to date—a modern mechanized Mr. Greatheart, possessing a sense of humor that was so lacking in Bunyan and the Puritans.

(3) Service to the community, not self, must be the underlying motif. The men understand this and appreciate the importance of all pulling together. No man will do his best unless he feels that he is one of a team; the old Regular Army understood this even better than the present-day citizen soldier.

Sir Richard Gregory, M.P., has stressed the ideal of service to the community in *The Forward March* and other books. He emphasized the importance of transferring to the tasks of peace the enthusiasm so readily called forth by the business of war, maintaining with much cogency that a new conception and a new outlook on these lines will alone give us full victory over Naziism.

(4) It was the rape of Belgium that gave inspiration to countless thousands in the British cause during the last war, and this time we have a dozen nations prostrate under the Nazi jackboot. We must teach our men that there dwells in the heart of Europe a warped and a twisted people that has become a menace to the civilized world. It is a country whose love of power and regimentation has developed a gigantic war-machine and an aggressive nationalism that has turned it into a bandit nation.

Since it must be accepted for good or ill that love of fighting for its own sake is far from being a characteristic of the Anglo-Saxon race, we must work up a lively hate against the German and the Jap. It is the defense of his hearth and home that will inspire in the British soldier a feeling of hate for the enemy who is burning to destroy them. Our men will never give the service that is necessary in total war in an atmosphere of peace and apparent security.

The War Office has given us some good training films and these are helpful, but the powers-that-be sometimes trip up in this important task. In a recent series of pictures of the German Army, purposing to give to all ranks an idea of the appearance of the German soldier and reproduced no doubt straight from German sources, the Hun soldiers are represented as most magnificent and handsome specimens into whom no one would wish to insert a bayonet! The Russians would never make this sort of mistake.

The Army Bureau of Current Affairs could do much more in descriptions of the rape of Poland, the murder of Russian civilians, the wholesale starvation of the Greeks, the agony of the Czechs. Moreover, the soldier of a non-professional army wants reminding again and again that the war is very much his affair. Short graphic accounts of deeds of courage in recent fighting are admirable but it is pictorial representation that

counts for most. Many units have draughtsmen—official or otherwise—who can make their own posters with local color. Such subjects as the avoidance of waste, the importance of salvage, security, war savings and so on can all be introduced. The British soldier is terribly wasteful, slapdash and easy-going in his habits, and he wants reminding at every opportunity that such practices are actively helping the greatest pest that the world has ever known—Hitler and his Huns. In the Officer Cadet Training Unit which the writer had the honor to command, a minor feature was an hour a week—strictly voluntary—devoted to debates, brain-trusts, discussions and the like. One such period was devoted to this matter of propaganda, and the cadets generally agreed that the reality of total war would never be fully appreciated in those sections of the wage-earning classes that were being paid so much more in war than in peace, and who were suffering no real hardships or even discomfort. The importance of realism in training was also stressed, with the use of real bullets on occasions on the lines of training in the commandos.

In the light of the aftermath of the last war it was generally felt that the less said about post-war development the better. With reference to Roosevelt's four points, one cadet remarked with much cogency that compulsory church parade was hardly a suitable feature in an army that was fighting for religious freedom! It was agreed that the officer was the right person to supply propaganda teaching in the army, but it was also felt that many officers were not temperamentally suited for this.

What is crystal clear, is that the soldier wants to know the truth, however unpalatable it may be. That is one reason why the speeches of the Prime Minister are listened to in the Forces with so much more respect than those of some other Ministers. There is, however, much impatience at the muddles perpetrated by so many departments which direct or often misdirect the vital business of a nation at war, and it is felt that the penalties for gross ineptitude should be far more severe and far more strictly enforced. Total war can never be a kid-glove affair, as we are learning to our cost. It is mental alertness that is so much wanted and anyone who has dealings with O.C.T.U.'s and the training of officers knows that this is so often lacking, especially in the product of the state educational machine. Our leaders, both in and outside the Services, must possess the ability to devise and to improvise quickly and efficiently, so as to cope successfully with the many tricks of a skilful, cunning and resolute enemy in Europe and in Asia. War and peace are so utterly different, and the methods and mentality that were hardly good enough for peace, are hopelessly inadequate for war. Soft-soap and excuses are no good, and to cut out the dead wood is the first task in order that the young sap may get its chance to run freely. The trouble is that so much of the young sap seems to refuse to run freely when it gets its chance!

of mechanization unprecedented in military history.

Each battalion has over 250 mechanized vehicles, including armored cars with a high road speed, Bren carriers, troop-carrying trucks and motorcycles. Driving at the normal speed and density, the battalion vehicles make up a column thirteen miles long which would take over fifty minutes to pass a saluting base. Armament includes anti-tank artillery, .55 rifles and grenades, batteries of mortars and hosts of tommy-guns and light machine guns.

Naturally the best men are required to master these new engines of war. Before being accepted at the Center, candidates must get high marks in psychological examinations which test quickness of decision and mental alertness. Journalists and schoolmasters are the most widely represented among the professions. Quick gathering of information about the enemy and good man-management are vital to the conduct of operations.

If possible, the battalion will probe the enemy lines by cunning and stealth. But if it has to fight for its facts, then it can turn on a blast of fire that no battalion has ever possessed before. Therefore men must have brawn as well as brain. Training is hard and in some degree similar to that of the Commandos.

Tough Training

Trainees at the Center are formed into Recruit Companies for two months' basic drill, easy-going at first, but toughening up towards the end. Subjects include handling of weapons, anti-gas, marching and gymnastics. Instructors go to great pains in making their classes "Corps conscious." This is very necessary, for the Corps was comparatively unknown until recently. Trainees sometimes include men transferred from other regiments and wearing the new badges and buttons for the first time.

After basic training the men are posted to the Specialist Companies at the Center. Company "talent scouts"—officers and NCO's—have kept a close watch on the recruit squads during the early stages of training and can pick the right men for the right jobs.

No. 5 Company, which produces signalers, mechanics and motor-cyclists, has first choice. The signalers are the most important trainees in No. 5 Company, for wireless is the life-blood of reconnaissance. News obtained by the busy inquisitive scouts is of no avail unless quickly transmitted to Battalion Headquarters. In three months recruits master three different types of set which send information from the smallest sub-unit—to Battalion Headquarters. The wiring diagrams should be known by heart. Messages must be transmitted on the Morse buzzer at rates of twelve to fifteen words a minute.

The motor-cyclists—each battalion has over seventy—are also used for inter-communication. In three months the mechanics learn a trade which would not be mastered under a year in peace-time.

No. 3 Company produces crews for the armored cars and carriers. The men must not only know how to drive and maintain vehicles, they must learn sufficient tactics to take their place in an operational scout platoon when posted away from the Center. The correct procedure for transmitting messages to a receiver many miles away must be mastered. They must be well trained in reading one-inch and quarter-inch maps. A working knowledge of field engineering, demolition, and of mine clearing is essen-

The Reconnaissance Corps

[Reprinted from the *Fighting Forces* (British) April 1942.]

One of Britain's newest and most powerful weapons is being welded into shape at a Scottish training center.

It is the Reconnaissance Corps whose battalions (one to each infantry division) have a scale of armaments and a degree

FOREIGN MILITARY DIGESTS

tial. They should be able to hit both men and planes from the revolving turret of an armored car. They are taught something of driving, maintaining, and fighting by night. They must be quick to recognize enemy aircraft and tanks.

Finally there is the No. 4 Company which trains assault infantry. When the armored cars and carriers are held up during an operation, these men dismount from speedy little trucks and clear away the opposition. They are to swim rivers and scale rocks in full kit. The men are hardened by drill, physical exercises, and marches. Small groups are sent out to fend for themselves for two days with mess tins, rations, and two bivouac blankets. They must be capable of marching short distances at top speed. Scouting patrols, searching villages, and quick occupation of road blocks are taught. They must know how to read both British and foreign maps. They also learn driving and first aid, and should be able to dig the first stages of a trench system in half the normal time. Their weapon training is brought to a high pitch on the field-firing range.

Initiative and quickness of decision are tested on special "blitz ranges." A man selects his weapons before starting round the course with the instructor. At various points he is "attacked" by dummy targets concealed behind trees and bushes, he comes across trench systems, shacks full of "enemy" and snipers. Some of the attacks are so sudden that he has to fire his service rifle from the hip. At the end of the course the men are told how many mistakes they have made and how many "casualties" they have inflicted.

The Center's instructors are kept well up to scratch. There are special hardening courses for junior NCO's. Everyday the officers, from the adjutant downwards, and warrant officers do rifle exercises and marching drill under the Center's Regimental Sergeant-Major. The latter is an old Grenadier who felt considerable grief when he changed his Guards' uniform. He now says that he has never seen such a fine show as the Reconnaissance Corps.

Every afternoon the whole Center, from the Commanding Officer to the youngest recruit, have fifteen minutes' "blitz" in weapon training. Cross-country running is one of the most popular pastimes. Beagles are kept and prove of great assistance in developing an eye for country.

If the candidates show exceptional promise they are eventually sent for six

months to the Reconnaissance OCTU not far from the Center. A very high standard is demanded from the cadets. Until recently the Commandant had awarded only one "A" certificate for exceptional work. The quality had improved so much during the last course that three "A's" were awarded.

The cadets do ordinary infantry training during the first three months. Then they learn the intricacies of the internal combustion engine. Groups of vehicles are lined up, each of which has some technical fault. Cadets must right the wrong in a limited time.

There is little time to wait for a Repair Section during a reconnaissance, and cadets are taught ingenious methods of keeping their vehicles on the move. Recently a carrier driver, taking an important part in an exercise, discovered that his fan belt was broken. Almost as second nature he pulled off his braces and made a temporary belt. He then climbed back into his vehicle, holding up his trousers, and brought his carrier safely back to harbour. (The Army presented him with a brand new pair of braces in recognition of his deed!)

Cadets learn to master wireless. Then comes the most serious side of their work—reconnaissance exercises with a company entirely composed of cadets who command the various armored sub-units in rotation. One day a young lance corporal will be a company commander, a job normally undertaken by a major. The next day he will be an ordinary driver. This system increases the versatility of the cadets. When commissioned they will know all the jobs of all the men under their command.

During the exercise the cadet company commander receives orders from Battalion Headquarters. He must quickly grasp the points vital to his own company and transmit a quick summary to his platoons, who in turn wireless instructions to sections. Cadets can get their armored companies on the move in five minutes after receiving battalion orders.

There is a field-firing range on the hills where ball ammunition is fired from mortars and machine guns. Cadets are also taught to make forced marches in full kit. Recently a group marched ten miles in one hour and forty-five minutes. They also have to jump trenches and wire obstacles and scale high brick walls in special assault courses. Rugger (a well known game) and soccer are played.

A Combined General Staff

Three Fighting Services as One Force

[An article from *The Times Weekly* (London) 15 April 1942.]

The fall of Singapore raised some insistant questions not only in the purely military sphere, but upon the system responsible for the higher conduct of the war. Victory will depend upon close coordination of the three fighting services in a common strategical plan. Defects in such coordination were evident enough in Norway, Flanders, Greece, and Crete. They were heavily paid for by the Navy and the Army, but accepted as insurmountable in the conditions of that time. Our strength is now much greater, and it should suffice to provide the essential balance between the services, whatever critical operations are in hand. It has, therefore, disturbed all men of knowledge and experience in that sphere to find

that once again at Singapore the action of the three services was clearly not combined in a single defensive plan.

A Great General Staff

A single command over all three services has recently been instituted in more than one theater of war, and that method of closely combining the action of the services in the field will no doubt be followed more and more. But coordination in each theatre of the forces which have been posted there cannot give us what we need unless the same coordination is thoroughly effective in the different theatres and forms the strategic plans.

Peers of great experience have made illuminating speeches on the subject in

recent debates of the House of Lords, and they show some considerable measure of agreement upon the main reform required. It lies in the direction giving greater scope and power to the Combined General Staffs of the three services which is already at work in sub-committee below the level where decisions are made. Lord Swinton, for instance, pointed out that the problem of defense at Singapore was completely transformed at the moment, many months ago, when Indo-China passed under Japanese control. It certainly appears that the need of combined three-service defense which then became grave would have been anticipated and met by a Combined General Staff with adequate opportunity and power.

The question, then, is how a Combined General Staff is to be given adequate influence over strategy in its early formative stages at the centre of affairs. I find it hard for my part to believe that a Combined General Staff will give us what we require so long as it has no chief of its own. The Chiefs of Staff whom the Combined Staff sub-committees at present serve have each of them their separate pre-occupations and an immense amount of work to discharge. However able the combined General Staff (and we have many officers of great capacity who have been through the Imperial Defence College founded after the last war), it must be handicapped by the fact that it serves a committee of that tripartite kind.

Functions of a Chief

It is said that the Chiefs of Staff seldom disagree. If that be indeed so, their recommendations must often be a matter of compromise, a lowest common denominator between incompatible ideas. That is not a method which wins wars. It has certainly lost us the Malayan archipelago, and it may, if uncorrected, lose us much more; for it resembles too closely the cooperation of loyal but independent allies—a system of control whose weakness in the swift emergencies of war is proverbial. It is no criticism of the various Chiefs of Staff who have carried us through one of the worst periods in our history to say that, with the experience of Singapore to teach us, we now require something more.

The Chief of the Combined General Staff should, in my submission, have no executive power at all. His post should be a service post or at any rate a non-Ministerial one, with no responsibility but that of presiding over the Chiefs of Staff Committee and advising the War Cabinet on the long-range conduct of the war. The Chiefs of Staff would remain the constitutional channel for orders to their respective services, and they would take their orders as now from their Ministerial superiors. Each should retain the right of putting his advice direct to the Prime Minister and the War Cabinet if he found himself in sufficient disagreement with the advice which the Chief of the Combined General Staff had decided to give. The C.G.S. (it is convenient to abbreviate his title in the traditional way) would be responsible only for three main duties of a nonexecutive kind, namely:—

1. He would as Chief of the Combined General Staff be responsible for presenting its plans to the Chiefs of Staff Committee, sifting them with that committee and thereafter submitting them to the War Cabinet.

2. He would be responsible for seeing that our strategic plans took full account of what the production staff and transport authorities may be expected to achieve.

MILITARY REVIEW

The present system, for instance, puts sudden strains upon our shipping programmes which greater foresight would minimize.

3. He would, above all, be responsible that in all operational plans the proper balance between the services was maintained, so that the Commanders-in-Chief in the various theatres could use the three services wherever necessary as instruments of a single balanced plan.

Middle-Man

It has, after all, been found essential to appoint a Minister of Production to bring the whole field of production under the direction of a single brain and will. Our strategic plans seem to be to require a similar process of coordination under a single mind. Whereas, however, production is a highly political business which only a Minister can handle as a whole, that is not the case with professional strategic plans. These latter should be immune from political influence at the formative stage; the merits and demerits of any course of action should be weighed in the first instance by cool and concrete professional minds, and these should work unhampered by political suggestion or surveillance of any kind. The C.C.G.S. should therefore be a professional or non-ministerial middleman, bringing all essential factors together and serving all three service chiefs by laying combined

plans before them and also by sifting and fusing their special knowledge and separate service ideas.

There was a passage in Lord Swinton's speech in the House of Lords which points as it seems to me unansweredly to the need of such a reviewing, coordinating, and foreseeing mind:

"I suppose every one would agree—it is an easy thing to say—that the most essential thing in war is to avoid being surprised and, if possible, to surprise the enemy yourself. There are times when unforeseen circumstances will necessitate improvised measures, but it is the function of a great General Staff, by precision and provision to anticipate surprises and to reduce them to a minimum. In what has become literally a world war, we should be satisfied with nothing less than a great Combined General Staff, devoting itself entirely to strategy, with its economic consequences, and adequately served in personnel. It may be said that these are obvious truisms. That may be, but they are the kind of truths on the appreciation and application of which success or failure may well depend.

There indeed lies the crying need; but I do not see how a great general staff can meet it without a single chief of its own to give weight, precision, and real unity to its studies and its plans.

School for Glider Pilots

[Reprinted from *The Aeroplane* (London) 3 July 1942.]

If England was slow to detect the military value of the glider it was because her ways were the ways of peace and her preparations for war were half-hearted. To her, gliding was the first step towards sailplaning and sailplaning was pure sport. She could not picture aerial legions being borne into battle on the wings of the wind, and would have dismissed as fantastic any notion that the glider might one day give her Army a mobility it had never before possessed.

Another nation taught her how gliders could be invested with military qualities of great merit. That nation showed her how armed soldiers and their supplies might be conveyed across narrow seas—and pointed the way to the solution of her own problem. How and when she proposes to solve her problem is largely secret, but signs are not lacking that when the time comes the teacher will find that he taught an adept pupil.

Gliders are pouring from British factories in many shapes and sizes. The skies are dotted with hard-working tugs towing their silent companies behind them. Flying schools are training glider pilots by the score, and when the glider armada has been assembled another British Expeditionary Force will sally forth this time like a cloud that will darken the sun.

Much of the success of any airborne invasion must depend upon the skill of the men who pilot the gliders, and the training of the British pilots goes far beyond the mere art of flying. Men chosen for training are all from the Army. They are mostly NCO's with the rank of Corporal; some are sergeants and above, and some are officers. They are all volunteers and have to pass a reasonably stiff medical and educational examination. The first stage of their training is given by the

Army at a school which corresponds to the RAF's Initial Training Wing. The syllabus is based on the RAF syllabus, but the time allowed for its completion is slightly shorter.

With the Army ITW examinations successfully passed, the pupil learns to fly an elementary training aeroplane at an RAF Flying Training School. The course is almost identical with that followed by RAF pupils, but greater emphasis is laid upon precision in landings. The reason for this is clear. The pupil will shortly be flying a type of aeroplane on which he will have no option of opening the throttle and going round again if he misjudges his approach. The training at the EFTS also includes some acrobatics and a few hours of night flying.

Next, the pupil goes to a Glider School, where he is "converted" to gliders. Here, no time is spent in winch or hillside launching. The pupil is put straight into the trainer and taken into the air behind a tug. His first flight is made as a passenger in the rear seat, but for the rest of the course he takes the front seat, and the instructor sits behind. After his conversion, he goes to a Glider Operational Training Unit, where he is given advanced training and then, fully qualified, he joins an Airborne Division.

Until now, few details had been made public about the training of glider pilots for work with the Airborne Divisions, but a recent visit arranged by the Air Ministry to one of its Glider Schools lifted, if only a little, a corner of the veil of secrecy.

The glider used for training at this school is the Hotspur, which was designed by General Aircraft Limited. To convert it into a trainer the pilot's cockpit hood was altered, but basically the training and the operational Hotspur are the same.

The tugs are old biplanes—chiefly Hectors—but they are shortly to be returned to retirement.

A stout two-inch hemp, or two-and-a-half-inch Manila rope is used for towing. A rather elaborate attachment has been devised for both glider and tug, but it gives no trouble and never fails to perform its proper function when the release wire is pulled. Each rope is tested after every flight and is replaced after 30 tows.

The Glider Technique

For the pupil, the trickiest moment is at take-off. The glider almost invariably becomes airborne before the tug and for a short period is flying in the tug's slipstream. A too sudden climb would tend to hold the tug on the ground and the glider pilot settles down to level flight at about five feet from the ground and thus rides above the turbulent air. As the tug comes off and climbs, so the glider pilot climbs too, always trying to keep five feet above the level of the tug until he casts off.

In the early part of the training the cast-off is made at a precise height and at an exact point in relation to the aerodrome. The pupil thereby learns the correct radius and angle of glide, and acquires skill in the use of his flaps. Later, his cast-off point and height are varied. Later still, he learns to make complete circuits and landings "on tow." The glide is fairly fast; with no passengers or ballast the speed is about 60 mph. The landing is similar to the tricycle technique. The glide is checked, but to reduce forward speed after landing, as the wheels have no brakes, the nose is held down so that the skid rubs along the ground. This gives the curious illusion that the Hotspur is liable at any moment to bury itself and vanish from sight.

The pupil also learns another method of approach. In this, he dives steeply while still some distance from his landing place, and flies at grass-top level on the momentum gained in the dive. He disappears from the view of watchers on the aerodrome, reappears as he clears trees, hedges or houses, vanishes again and then comes leaping over the boundary hedge like a steeplechaser. This method has obvious tactical advantages.

When his training is nearing its end, the pupil is taught to fly in formation both behind a tug and after casting off. This, perhaps, is the most difficult and the most interesting part of the course. Hitherto the pupil had only to watch his tug; now he must watch his neighbours too, and the sight of stout rope cables dancing all around him and, seemingly, eager to slice off his wing, makes him doubly vigilant. Fortunately, he is not distracted by the tumultuous racket of motor and airscrew; outside his enclosed cockpit a hurricane rages, but he is able to talk in normal tones. Nor is he bothered with helmet or headphones.

At no point in the training at this School does he carry a full load of passengers. Instead, his glider is filled with ballast when his training is well advanced. If the impressions gained during a one-day visit are reliable, this School seems to be run with a high degree of efficiency. Tugs and gliders take off at regular intervals, each making about four flights an hour. The cast-off is made, by the glider, at about 1,500 feet. The tug then dives away and flies back to the aerodrome where the pilot drops the tow rope. He then makes another circuit and lands. Meanwhile, the glider has been gradually losing height as it approaches the aerodrome and both tug and glider return

FOREIGN MILITARY DIGESTS

almost at the same moment. When the wind is right, tugs land on one side of the aerodrome and gliders on the other.

The tow ropes are retrieved by a ground party, tested, rewound on a drum, and brought back to the take-off point. They are then unrolled and laid out ready for use again.

Much of the School's efficiency arises from the fact that its Commanding Officer, its Chief Instructor and its Flight Commanders are all old glider pilots. The Commanding Officer is a former member of the London Gliding Club and

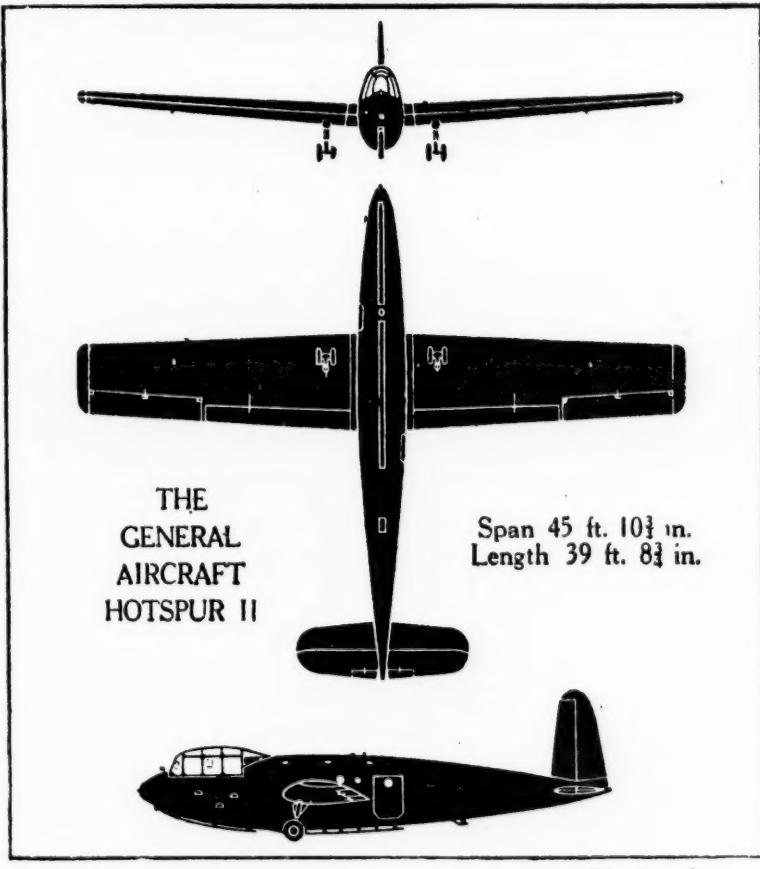
one of his Flight Commanders (also a Dunstable man) once shared the World's duration record for gliders. Their enthusiasm has been caught by all the other instructors and nowhere is the team spirit more marked than here. Half the instructors are NCO pilots and the rest officer pilots. All belong to the RAF. They take turns in coaching the pupils and in flying the tugs. They have all had much operational experience, either with the Royal Air Force or with the Fleet Air Arm, and few of them have less than 2,000 hours of flying.

As for the pupils, their keenness defies description. Nearly all of them had wanted to join the Royal Air Forces when the War was very young, but in those days vacancies were few and they had to join the Army. The coming of the Airborne Divisions gave them the opportunity to fly which they thought had passed them by, and their selection for training as glider pilots gave them no less pleasure than they would have derived had the Royal Air Forces taken them as pilots. These men know that theirs is a responsible job. They will have to deliver so many men or so much material at a specified point—probably in enemy-held territory—and they must have the skill and knowledge to fulfil their tasks. In the air they are pilots; on the ground they become soldiers again, skilled in the use of arms and qualified in every way to engage in hazardous adventure.

The gliders they fly are built for a short life. Some will make return journeys, but the majority will be left where they land. To eyes long grown accustomed to refinement in aircraft construction, the absence of it in the Hotspur was almost offensive. Yet, to have built elegantly for so brief an existence would have been mere extravagance. All the fittings are of the most elementary design, and cockpit dashboard boasts nothing more than the essential instruments—an air speed indicator, an altimeter, a turn and bank indicator, and a rate of climb indicator.

Like all other new types, the Hotspur has had its teething troubles, but in overcoming them the makers have had the advantage of working with men who have long been familiar with gliders. Several changes have been made since the machine first went into service. Among them is a new skid and an alteration in the position of the tow rope attachment. This was formerly under the belly of the machine, near the center of gravity; now it is in the nose.

These modifications have not been allowed to interfere with training, and the army of Army glider pilots has been steadily growing. No facts about their numbers may be given here, but they are numerous enough to launch a formidable invasion fleet. If the United Nations' undertaking to open a second front in Europe in 1942 is to be discharged, the Army may soon have the chance to prove the full vigour of its newly acquired wings.—S.V.



Attack of a German Fortified Position

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the Russian article, "Shturm Nevel'skovo Dzota," by Major V. Avilov, Russian Army, in *Krasnaya Zvezda* 4 April 1942.]

On one of the sectors of the front there was a fortified German position placed in front of the front line of resistance. It was built of logs and earth. From it machine-gun fire covered the forest glade over which our units were to advance. In view of this it was decided to destroy this fortified position. Its exact location was established by reconnaissance. It was built so that it rose above ground level about 60 to 70 centimeters, and, apparently, had a roof of light construction which permitted its destruction by antitank shells, without the use of explosive agents. Behind this fortification there was a blindage to which led a communication trench farther to the rear.

Both the communication trench and the blindage were protected by a barricade of snow about 1 1/2 meters high.

The fortification was connected by telephone with the blindage and from the latter there was a line in the neighboring blindage. It was established by observation that every 30 to 40 minutes, a change of machine-gun crews took place inside the fortification. The relieving personnel then would proceed through the communication trench to the blindage.

At night the Germans would fire rockets from the blindage.

A group of eighteen men was detailed for the destruction of this fortification. It was armed with machine-gun pistols,

portable machine guns and automatic rifles. The men also carried two to three hand grenades each. In addition to this the group took along four antitank grenades.

As soon as darkness fell the group swung into action. Three men were left in ambush for the purpose of covering the group in the event that it would be outflanked from the north. From the west the group was covered by two men with a portable machine gun, placed forward in the thin forest. Having approached the fortification by crawling on the ground the group took up a jump-off position, while two pioneers and three riflemen moved to the rear of the fortification. It was their mission to provide cover for the balance of the group which was to attack.

Soon after reaching the jump-off position the telephone line between the blindage was successfully cut. Now it was

MILITARY REVIEW

necessary to begin the attack immediately before the disrupted communication put the Germans on the alert.

Three pioneers and two riflemen proceeded towards the fortifications, and three riflemen towards the blindage. While moving towards the blindage the riflemen noticed a German soldier running in the communication trench. They fell upon him attempting to capture him, but the German fired an automatic pistol and wounded one of our men. He was killed instantly.

The Germans who were inside the fortifications opened automatic weapon fire through the entrance door. Two pioneers approached the door and threw into the fortification two hand grenades, and followed this with two antitank grenades. The detonation caused the roof of the fortification to cave in. Taking advantage of the fact that enemy fire ceased the riflemen approached the blindage and destroyed it with two antitank grenades. German soldiers who were inside the fortification and the blindage were killed. Two of our men were wounded.

Without investigating the situation the main enemy positions opened with machine-gun and mortar fire, and began to fire illuminating rockets. However, the enemy failed to find the storm detachment. Having escaped direct enemy fire the group successfully returned to its unit. Its mission was executed.

The actions of this group do not provide the basis for drawing exhaustive conclusions regarding the nature and method of the work of similar detachments. However, certain conclusions may be drawn.

First of all it is evident that a storm detachment should be divided into two groups; the storm group proper, and the covering group. In cases where it is necessary to fight against log and earth fortifications of heavy construction, and when it is necessary to employ explosive agents, it will be advisable to also have a group carrying ammunition supplies. The latter may be simultaneously employed as the reserve. The attack of the reinforced and heavy fortification should be entrusted to storm detachments of pioneer units. In the example which we have given here the attack mission could have been successfully executed by an infantry detachment; the pioneers could have been employed for reconnaissance only.

Cover for the attacking group was properly organized in this case, but it was not carried through to its logical conclusion. It was fortunate that in addition to the direct cover protection there also was protection against possible enemy flanking movements from the north and the west. But the real shortcoming was in the absence of fire co-operation between the cells of the covering group. It is unfortunate that no artillery and trench mortar fire support was organized for the storm group in the event they were located by the enemy during retirement after execution of its mission. The availability of radio communication made such support feasible.

It is the general belief that a storm detachment should be given the mission of destroying only one fortification. Generally this is true. However, where there are two neighboring fortifications (for instance, a log and earth pill box and blindage, such as in this case), which are mutually inter-dependent, then the task of destruction may be assigned to one detachment. The selection of night time for the operation of a storm detachment should be considered as a happy one, moreover because this mission was executed beyond the zone of friendly lines.

The most generally accepted numerical strength of a storm detachment is from eight to twelve men. It is easier to direct such a group and it can work in greater secrecy. In the example given here the group consisted of eighteen men, but here the usual norm was exceeded, because the action involved forest terrain and the problems of cover, naturally were broader.

A few words on the armament of the detachment. The presence only of automatic and semi-automatic weapons is fully logical, and this is proved by a number of examples. But only four antitank grenades, are clearly insufficient and therefore, the actions of this group were connected with a risk. It is necessary to have two antitank grenades for each man of the storm detachment.

Once again it was shown how necessary is reconnaissance of the attacked objects. It is important that the commander of the detachment should carefully study reconnaissance results directly on the terrain and familiarize the personnel with the details when assigning missions.

Colonel Lutzow, Majors Trautloft and Oesau, all belonged to the Condor Legion. Most of the holders of the Knight's Insignia of the Iron Cross flew in the Spanish War.

Like the German Army, the Luftwaffe suffered heavy losses during the Russian Winter offensive. It has paid a heavy price for its raids on Malta, and in meeting the daylight challenge of the R.A.F. over France and the Low Countries. The number of obituary notices in German papers announcing the death of Luftwaffe personnel who fought in Spain rose sharply during the winter months. There were many fatal accidents, and the Luftwaffe's fighting strength was drained still more by transfers of experienced airmen to training schools or to the staffs of the Air Divisions, Air Corps or Air Fleets and other administrative posts where their experience was considered of great importance. Moreover, several Luftwaffe officers—their number will remain unknown until the end of the War—were drafted in other services, and there is at least one instance of a former pilot of the Condor Legion becoming a submarine Commander.

Airmen trained since the outbreak of the war have been sent into action by the thousands. Although many of them have shown courage and skill as high as that of their older comrades, they lack the long experience which the "Spaniards" gained. Moreover, they are not as well trained as the regular airmen of those who joined the front-line unit during the first 18 months of the War.

Since the Battle of Britain, when the Luftwaffe suffered its first severe losses, training has had to be accelerated to match the output of the British Commonwealth Joint Air Training Plan.

Before the War, German pupils averaged about 200 flying hours before they received their wings, and underwent special operational instructions before going to a Staffel. Now, the average pupil obtains his pilot's certificate after 100 hours, and most of the operational training is gained on active service. As the selection of candidates is now less strict than before the War, the average German pilot of today cannot be as efficient as the average airman of a year ago, and still less than at the beginning of the War.

Equipment

Squadrons of the Luftwaffe fighting on the principal fronts—in particular over the Channel area—are equipped with better aeroplanes than they had a year ago. The Me 109F1 and F2 and the Focke-Wulf Fw 190H single-seat fighters have better performance than the earlier Me 109E. The Me 110c is being replaced by the Me 210, and reports from Germany indicate that the Focke-Wulf Company is still experimenting with the Fw 187 Zerstoerer. The Henschel Hs 126 is no longer in quantity production and is being replaced by the more efficient Fw 189 twin-boom type built for tactical reconnaissance and ground attack. Of the new bombers, only the Dornier Do 217 multi-purpose bomber is yet in service. Comparatively few of the queer looking three-seat Blohm and Voss Bv 141, the four-motor He 177 and the new Junkers Ju 91 four-motor bombers have been in service so far. These types are only just coming into quantity production and few are likely to be seen for some time—unless there is truth in the report that German aircraft factories in former Polish territory have been building new types in large numbers for some

The Luftwaffe—Its Strength and Dispositions

[An article appearing in *The Aeroplane* (British) 29 May 1942.]

An examination of Germany's air strength today suggests that the Luftwaffe of 1942 is inferior, both in numbers and in quality, to the Luftwaffe of 1941.

Such a statement may appear to be born of optimism, yet the more the facts are probed the more certain the condition appears. The flying equipment of the Luftwaffe has been improved during the past year, but the introduction of new fighters and bombers cannot make good shortcomings in other fields.

Briefly the reasons for the present shortcomings are:

i Loss of valuable leaders and experienced pilots.

ii Less thorough training.

iii A wider distribution enforced on the Luftwaffe.

iv Heavy losses in Russia and over Malta.

v Curtailed production as the result of R.A.F. bombing.

vi A falling aircraft production relative to Allied production.

Personnel

The backbone of the Luftwaffe's flying personnel has been the several thousands of ex-members of the Condor Legion who fought in Spain. They were the first European airmen to gain experience of air tactics in modern war. Almost all the well-known Commodores and Wing Commanders of Jagdgeschwader, and practically all the fighter pilots with more than 70 victories to their credit, belonged to that crack formation. The late Colonel Molders, the late Majors Wick and Balthasar, the present Inspector of Fighters, Colonel Galland, and the Commoires of Jagdgeschwader, Lieutenant

FOREIGN MILITARY DIGESTS

time and that these machines are held in reserve.

Even were the machines available, the training of airmen to fly them would take several months and this might explain, at least partly, the reduced activities of the Luftwaffe on several fronts during the Winter.

The Luftwaffe's improved equipment alone cannot win it equality in the air in the future. Its position will depend upon the efficiency of the flying crews, and there is evidence that the German airmen of 1942 are not yet able to get the best from their new aeroplanes. Even the older standard British and American types have shown that they are not inferior to the newest German designs.

Numbers

But perhaps the most important point of all is the numerical strength of the Luftwaffe. The Luftwaffe of 1942 is certainly inferior in numbers to the Luftwaffe at the outbreak of the Russian campaign. At that time the operational strength of the Luftwaffe was about 6,500 first-line aeroplanes. This fell to about 4,000 machines by the end of 1941 and the first-line operational strength can now hardly exceed 5,000.

This deficiency in numbers is not offset by the higher quality of the equipment. More efficient fighters and bombers can make good a deficiency in numbers only when the opposing air force cannot command aeroplanes of equal quality, or when the force with superior quality can concentrate at a few vital points while the more numerous force is widely scattered. Neither condition applies to the Luftwaffe. Allied Air Forces are using aeroplanes at least equal in quality, and the Luftwaffe is now widely scattered and unable to concentrate as it could in the early days of the War. It must be used to protect the territory the Nazis have overrun.

Distribution—1941

At the start of the Russian campaign in June, 1941, the bulk of the Staffeln of the Luftwaffe were stationed along the Eastern Front, waiting for reinforcements, particularly in fighters, from Marshal Sperrle's Luftflotte which had had to guard the Western Front. The units did not arrive before the middle of July in the Southern and Central sectors of the front.

Elsewhere there were only comparatively small Luftwaffe contingents. General Geissler's Air Corps had been recalled from Sicily and had gone East. North Africa held a bare 200 fighters, reconnaissance machines, Stukas and bombers; more were not required as the opposing British forces did not receive reinforcements until some months later. Practically all the Luftwaffe units which had fought in the Balkans and over Crete had been transferred to the Ukraine.

Probably fewer than 50 German first-line aeroplanes were stationed in Greece and Crete, and even the Italian air units which could be spared for newly occupied countries were small because of the heavy losses which Mussolini's "White Eagles" had suffered from the attacks of the Royal Air Force in Africa.

Inside Germany, fighter—and in particular night fighter—protection was poor. General Kammhuber was busy forming his Night Fighter Division which was to be equipped with more suitable types. Until then, the chief German night fighters were the elderly Arado Ar 68 Heinkel He 51 single-seat fighter biplanes, although a few He 111s

and Me 110s were used. The new Night Fighter Division was to be equipped with Me 109s for interceptor work, with Me 110s for pursuit, and with Ju 88B night fighters for pursuit and intruder work. Kammhuber's units were originally intended for the protection of such important targets as Hamburg, Bremen, Wilhelmshaven and Emden—the same area, roughly, which was covered by the Schumacher Fighter Group in 1939. Kammhuber's air unit was then hardly more than a skeleton organization, and even in July 1941, night fighter opposition was still weak except over Hamburg.

Thus the chief strength of the Luftwaffe was concentrated on the Eastern and Western Fronts, while the two other fronts in Africa and the Balkans were merely side-shows.

Production

The pauses in air operations during the Winters of the first two years of the War were not accidental. The Germans used them to overhaul their war machine, to improve its organization according to the lessons learned, to train and re-equip the troops, and to prepare for coming offensives. Something like a million and a half men were sent to the factories in each of the two first Winters of the War in order to speed up production, but in the third Winter the Russian offensive upset the Nazis' plan and demanded the recall of thousands of German soldiers who had been sent home on industrial leave. In consequence, armament of production schedules were not fulfilled and still sterner measures had to be enforced to raise factory outputs. One of the new rules made absenteeism a crime almost as great as treason.

Shortage of labour is Germany's most serious problem—as it was in the last War. In an attempt to overcome it, the Germans are employing still more women in industry and still more foreigners. In BMW's new plant near Munich, for instance, foreign workmen who previously were not allowed as much as a glance inside an assembly shed are now helping to assemble the new BMW 801 motors, and even Heinkel has had to change his policy and employ foreigners in vital departments of his works. Foreigners are now working in Germany in such huge numbers that even the newspapers cannot avoid commenting on the fact. As in the last War, the "Volk ohne Raum" (the people without space) has become a "Raum ohne Volk" (a space without people).

In quantity and quality the work of the foreigners employed in armament plants disappointed the German authorities and special orders for the supervision of the non-Germanic "Arbeitskameraden" (work-mates) were issued. Theoretically, foreign workmen are protected by the German labour legislation, but their employers can easily obtain exemption from many of the rules by pleading "the national interest." As the definition of "national interest" has never been clearly stated in Germany, there is practically no limit to the power of the employer of foreign labour over his employees.

Despite all the measures taken, aircraft production from June, 1941, to the end of the first quarter of 1942 fell far short of German needs. Output increased by a bare 10 per cent, and was attained only by extending existing plants. Though higher than a year ago, production is inadequate to meet the increased commitments of the Luftwaffe and, judged side by side with Allied production, shows a comparative decline that may soon become catastrophic.

But it is too early to assume that the symptoms now visible are comparable with those that marked the decline of German air power in the last war.

The Present Distribution

The present distribution of the Luftwaffe is approximately as follows:

Western Europe:

Northern France—Part of Third Air Fleet (Marshal Sperrle).

Norway—Part of Fifth Air Fleet (Generaloberst Stumpff).

Southern France—Part of the Third Air Fleet (Marshal Sperrle).

Total about 1,350 Operational Aircraft.

Mediterranean Area:

Italy and Sicily—Part of Second Air Fleet (Marshal Kesselring).

Greece and Crete—Bomber Group of Fourth Air Fleet (General Felmy).

North Africa—Tenth Air Corps, Afrika Korp (General Frolich).

Total about 1,300 Operational Aircraft.

Central Europe:

Germany—Two Night Fighter Divisions (Generals Kammhuber and von Doering).

Balkans—German Rumanian Air Corps.

Total about 600 Operational Aircraft.

Russian Front:

Far North—Part of Fifth Air Fleet (Generaloberst Stumpff).

Leningrad Sector and Baltic—First Air Fleet (Generaloberst Keller).

Moscow Sector—Part of Second Air Fleet (Marshal Kesselring).

Southern Sector—Part of Fourth Air Fleet (Generaloberst Lohr).

Total about 1,600 Operational Aircraft.

The estimated total of 5,000 operational aircraft does not include transports or reserves, but makes up those squadrons which are in the actual Order of Battle of the Luftwaffe.

The Western Front is considered by the enemy to be of supreme importance, particularly since the Royal Air Force began its daylight air offensive in February 1941, against military targets in the Low Countries and Northern France. The number of fighters which Marshal Sperrle has at his disposal may not be great, but the Jagdgeschwader under his command are the best in the Luftwaffe. Two of the six fighter groups are the famous Richthofen and Schlageter Jagdgeschwader which have been fighting in this area since the Battle of Britain.

The Richthofen Group lost two famous Group Captains, Major Wick and Hauptmann Balthasar, both ex- "Spaniards." The present commander, Major Oesau, also belonged to the Legion Condor. A third Group, the Schlageter, was commanded by Colonel Galland, who succeeded the late Colonel Molders as Inspector of Fighters. How important the enemy considered this front can be judged from the fact that both the Me 109F and the Fw 190 were delivered first to the Staffeln fighting in the Channel area.

In bomber strength the Sperrle Air Fleet, whose Chief of Staff is Colonel Koller, is not great, consisting of about 10 ordinary bomber wings and the "long-range" wing with headquarters at the Marignac-aerodrome near Bordeaux, from which the Focke-Wulf 200Ks start on their commerce-raiding flights over the Atlantic. This wing also operates from an aerodrome in the neighborhood of Brest on short-range patrols, mainly

MILITARY REVIEW

with the He 111s. This formation is to receive new types in the near future; these will probably be either the new four-motor Junkers bombers or He 177s. The remainder of Sperrle's bomber force, which amounted to at least five bomber groups during the Battle of Britain, is distributed all over Europe. Several wings operate from Norway against this country; others went to Sicily in the first months of last year and returned to their former bases when raids on Malta had to stop. One bombing wing which took part in all these operations is now stationed in Holland and flies Ju 88s, a type which seems to be popular with German crews. For mine-laying and torpedo-carrying duties, the Sperrle bomber Staffeln are usually equipped with He 111s. During the second half of 1941, Sperrle's Command was reinforced with a wing or two of night fighters of the Kammhuber Division for use mainly as intruder fighters. There is, finally, a small number of seaplanes, in particular the He 115, for reconnaissance.

An example of the Luftwaffe's extreme mobility was given when the three German warships *Genisena*, *Scharnhorst* and *Prinz Eugen* were transferred from Brest to North Sea ports. For this operation, fighter and bomber units were brought to France and the Low Countries from many points of Europe, including Italy, at short notice, and returned immediately the move was completed.

Norway and the northern sector of the Russian front, from Petsamo to the Karelian Isthmus, comprise the area of operations for the Generaloberst Stumpff's Fifth Air Fleet, the newest and smallest of the five German air fleets. Stumpff, perhaps the most cultured of the Luftwaffe's generals, came to England as the representative of the Luftwaffe at the funeral of King George V. The Chief of Staff of the Fifth Air Fleet is Lieutenant General Kuhne. The protection of the long Norwegian coast was entrusted to one fighter group alone until the Commando raids forced the Nazis to despatch more fighters to this front.

A strength of some 300 operational aeroplanes probably represent all the machines the Luftwaffe can spare for this sector. The Küstenseeflugkommando has also a few bases along the Norwegian coast, but the number of its flying boats and floatplanes is small.

Equipped principally with the Me 110s and Ju 88s, the remainder of Stumpff's Air Fleet operates in the Far North and in Finland. Among it are wings of "Adler" and of another Kamfgeschwader composed of crews with special experience in attacking ships.

The Baltic area and the Leningrad sector are covered by the First Air Fleet under the command of Generaloberst Keller, the "iron Keller," a Pour le Mérite bomber pilot of the last War. During the fierce German attacks on Leningrad in the Autumn of last year, Keller had two Air Corps at his disposal, one commanded by General Forster who, up to June of that year, had been in charge of the Training Division of the Luftwaffe, a unit which is not strictly an operational training formation, but is a miniature Luftwaffe for developing and testing new equipment under active service conditions and putting to proof new strategic and tactical theories. The other Air Corps, commanded by Generaloberst von Richthofen, is probably the most widely traveled unit of the Luftwaffe. It flew in Poland, Norway, Holland, Belgium and France, took part in the Battle of Britain, went to the Mediterranean, and

before it began its operations on the Southern sector of the Russian Front on June 22, assisted in the occupation of Jugoslavia, Greece and Crete. From the Southern sector it was sent to Moscow and finally to the Leningrad area. When the Germans had to give up the attacks on Leningrad, the Richthofen Corps went back to the Southern sector.

Richthofen's Stukas

There are more Stuka Staffeln in the Richthofen formation than in most other German Air Corps. Richthofen, the last commander of the Legion Condor, was the first officer of the Luftwaffe to test the Stuka arm in actual war conditions, and is said to be responsible for laying down the rules for the co-operation of tanks and dive bombers. When the war began he was entrusted with the command of an assault corps which had to blast a way for the attacking Panzer units. Richthofen is, of all Luftwaffe commanders, a typical Prussian he is brutal and ruthless and treats his men according to the old motto of the Prussian Army; "A soldier must be more afraid of his commanding officer than of the enemy." In addition to Luftwaffe units Richthofen also commands several of the small foreign air units such as the Croats and, temporarily, the Spanish air unit of the 18 fighter pilots.

The Moscow sector (from Rzhev to Briansk) is rated the most important of the entire Russian front and if the province of Kesseling—"Smiling-through-Albert" as he is called by his men. Until the end of last year, when part of his force was transferred to Southern Italy the Second Air Fleet was the strongest. It consisted of at least two Air Corps, one of which was commander by Generaloberst Loerzer, the man to whom Goering owes all his successes. In addition to these formations, the Kesseling Fleet was often reinforced by other units, such as the Richthofen Air Corps. Part of this air fleet was transferred to Italy and Sicily for the attack on Malta, but many units seem now to have returned to their Russian bases. This year the Nazis will be unable to withdraw all their forces from Sicily, and the presence of General Geissler in Italy indicates that the Nazis will keep more than an air corps in that country.

Generaloberst Lohr commands the Luftwaffe units on the southern part of the front. Lohr is the only Austrian among the Air Fleet generals, and received his high post because of his long membership in the Nazi party. What he lacks in ruthlessness is made up for by his Chief of Staff, Lieutenant General Gunther Korten, who was previously Sperrle's Chief of Staff. Under Lohr are two Air Corps commanded by Generals Pflugbell and Ritter von Greim. The latter, like Keller, is a Pour le Mérite of the last War and directed the operations of an Air Corps during the Battle of Britain. This Air Fleet has been reinforced temporarily by German and foreign air

units, such as the Italian Air Legion and General Speidel's Rumanian Air Corps, and appears, now, to be the strongest fleet of all.

Reports of the fighting on the Kerch Peninsula and the extensive use of dive bombers by the Germans indicate that Richthofen's Staffeln have returned to this sector. Nominally, Generaloberst Lohr is also in command of the German air units stationed in the Balkans, Greece and Crete. During the winter von Richthofen was reported to be supervising the training of new personnel—German and foreign—in Bulgaria and Croatia. The units stationed in Greece and Crete are mainly bomber wings equipped with He 111s and Ju 88s, the latter being used for both bombing and fighting.

Since the first Luftwaffe units were transferred to North Africa at the beginning of 1941, Lieutenant General Frohlich has been their commanding officer. Frohlich was in charge of a Fighter Group stationed in Breslau at the beginning of the War and was promoted very rapidly. Today his force, consisting of a large proportion of both Ju 87s and Ju 88s, cannot give up units to other fronts because of the pressure exerted upon it by the Royal Air Force in the Middle East.

Last in this survey comes Germany itself. Until the Lancaster raid on Augsburg on April 17 there were practically no day fighters for the protection of the Fatherland. The bad impression which this raid made on the German population has undoubtedly influenced the Luftwaffe Command to transfer at least a few fighter squadrons from the war zones to the homeland. The defence of the Reich against night attacks is entrusted to two fighter formations which, although called Divisions, have only the strength of two Fighter Groups each. They have to protect the whole area of the Reich and are scattered along the coast from Hamburg to Brest and from St. Nazaire to Hanover. One of these formations is commanded by Lieutenant General Kammhuber, who was shot down during a raid on Paris and became a prisoner of war with the French. When France collapsed he was among the 400 German airmen who were set free by the Pétain Government. On March 27, Kammhuber's Division claimed to have shot down 500 British bombers since its formation. The other night fighter formation is commanded by Lieutenant General von Doering, who was in charge of the Richthofen and Horst Wessel Jagdgeschwader before he was transferred to his present post.

Although the Luftwaffe is still a formidable force, which can hit very hard, it is definitely losing that degree of superiority which enabled the armed German forces to gain their spectacular success in the early days of the War. No one could be accused of wishful thinking if he regarded these symptoms as the prelude to the final and complete defeat of the German Air Force.

Visit to the Defense District Riding and Driving School

[An article by Karl Moeller which appeared in *Deutsche Wehr*
22 May 1942. Translated from German at the Command and General Staff School, Fort Leavenworth, Kansas.]

The motor has determined the form of present day warfare. As a source of motive power for the airplane and tank, for the most varied varieties of trucks

and passenger cars as well as motorcycles, the use of motorized formations in the so-called blitzkrieg, is dependent on it. Yet in spite of this, the horse has

maintained his place in the modern army. Along with the roar of the motor, the clatter of hoofs is also heard as our troops move forward, for the motor vehicle is not in its proper element everywhere nor is it most suited for every purpose. The horse has the advantage over the motor vehicle in another respect also, it is not so dependent as the latter on the supply column. For when the gas tank is empty, the motor stops, but the horse keeps going for a long time after the usual oats ration has come to an end, finds its food along the side of the road and in the barns of deserted villages and is always the willing and ever-ready friend of man. The horse often has given his life in the faithful discharge of his duty and for this reason receives the constant care of the soldier when on the march as well as when in the stables, on the front and in the home areas of the rear. Horses, riders and drivers are given an exemplary course of training to fit them for their future tasks.

At the age of at least three years, the horses are obtained by the armed forces in the remount markets and go then from the farmer or breeder to join their companions in the remount centers where they are given the opportunity to grow stronger and develop by lots of exercise in the open air.

After this the young remounts are given their pre-military training in the defense district riding and driving schools which also have the task of training troop and non-commissioned officers as riding and driving instructors; also the task of supervising and directing the riding and driving service in the various branches of the army with the view of maintaining uniformity. It is in this place, therefore, that officers, men and horses are training for their later tasks.

The effort is made to avoid machine-like routine in the training for neither man nor horse can be treated as a lifeless motor which transmits its effort through a system of drives and gears. Especially in the case of the horse, kindness and patience must be shown till it gets used to the strange saddle and learns the various gaits. The training is continued until rider and horse are able to cooperate smoothly, and a lump of sugar or a little oats as a reward, are able to accomplish wonders in connection with this. Later, in the field courses, they have the hardest lessons to learn.

Later, in leaps without a rider, the horse learns the best way to get over an obstacle and not till later is it required to carry the rider over obstacles which at first are low, but gradually are made higher. If the proper confidence has been established between rider and horse, even the most difficult of terrain, the steepest of slopes or the worst ditches will not be able to disturb this combination of rider and horse and they will then be capable of the highest accomplishments. By means of the most varied exercises carrying his rider, the horse is trained to the point where it does not become excited under any circumstances, even under the heaviest of fire. The rider is able to shoot with his carbine, standing, kneeling, or, by leaning forward on the neck of his horse and firing over his very head without his faithful, four-footed friend being disturbed by it.

From Training Wagon to Six-Horse Team

The training of the young horses for pulling vehicles is carried out just as systematically regardless of whether they are to be used in light teams or in six-

horse teams for heavy cannon. In the case of the heavy draft type of horses, all-around training is necessary in order that each animal may be used in any other place, when necessary. The best of equipment as well as theoretical and practical instruction and training give the officers and non-commissioned officers assigned for training as riding and driving instructors, the requisite ability to serve in this capacity with the troops. After the preliminary instruction during which, among other things, the pupil is taught the various manners of holding reins while seated at a table, the pupil begins his work on the training wagon with its high seat, which gives the beginner an especially good view of the team. In the following practical training all questions of the proper harnessing of horses and their care and feeding are discussed and demonstrated till riders, drivers and horses have reached the point

where they may be said to be well-trained.

It is always a beautiful sight to see a mounted formation riding across country in the bright sunlight. Amidst the clatter of hoofs, the commands ring out sharp and clear and are followed by the execution of the order by men and horses acting as one. Not till this stage of the training has been reached has the Fuehrer's statement been fulfilled, that "only the very best equipment and training are good enough for the best soldiers in the world."

Our farmers and landowners have given many horses to the armed forces. They know they are indispensable. For in the army as in the field of modern agriculture, neither the horse nor the motor can do the task alone, but the co-operation of the two is required which is best suited for the accomplishment of the task at hand.

Japanese Tanks

[An article by Heinz Bach. Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the German article "Japanische Kampfwagen" in *Deutsche Wehr* 17 April 1942.]

Shortly after the World War, Japan began to build up a modern tank arm. She could not depend on her own experience for guidance. She was forced to pattern first after the English, then the French—as she had had to do in similar cases before. Japan had no reason for

powers, decided to engage in an actively pursued program of development and modernization of her tank arm—which all too soon was to be needed.

First the purchase was made of an English Vickers MK. C tank (Fig. 1) which had originally been developed for

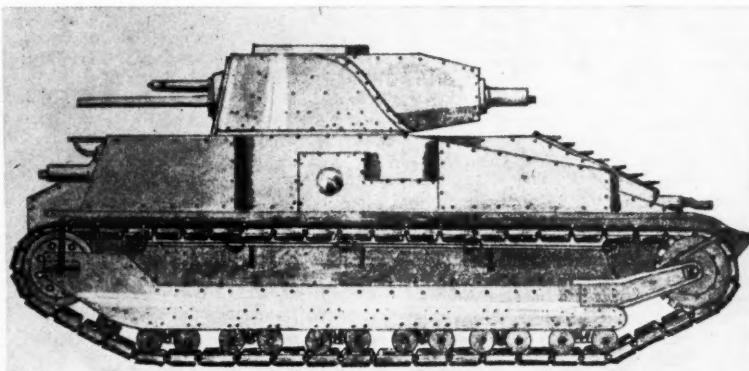


FIGURE 1.

hastening her efforts especially since even in Europe the tank was still in the experimental stage.

First the purchase was made of a few light English whippet tanks which had made their appearance as early as at the time of the World War. For about eight years, these long-since antiquated types, were standard troop equipment till Japan, in about 1927 or 1928, following the example of the great European

the English army, but (possibly on account of its light armor) had not been accepted by the military authorities. Japan now got busy, and built a tank which, while not entirely satisfactory was at least a modern and improved model. But before anything was done, the license to copy the model was obtained after which Japan got busy with the manufacture of tanks modeled after this pattern. In doing this, the Japanese did not follow the pattern of the English tank, but soon introduced ideas of their own.

From this beginning, a medium tank of about 14 tons weight (see Fig. 2) was gradually developed which may be regarded as an altogether modern tank employed not only in the Chinese campaign of 1932 but also employed in the present war in China and which has given good service wherever a tank could be employed.

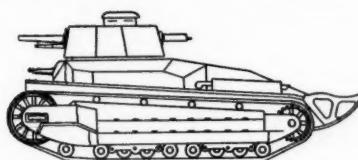


FIGURE 2.

MILITARY REVIEW

The illustration shows the latest type of a whole line of models which differ but little from one another in performance. For the first time, the whole of the running gear is covered by armor. The tail projection of the old Renault tank also

as appears likely to be the case, is not known. However, generally speaking, the trackless condition of China has limited the use of tank units.

In the way of small tanks, Japan has again developed a tank of its own design,

security of supply columns or advancing forces, providing, of course the nature of the roads permits their use, so-called highway tanks have rendered great service for the Japanese and have served more than once to break the way for the infantry.

The Vickers-Crossley M 25 type, a light English highway tank as well as Japanese types have been used. The first, with six-wheeled chassis is, in its design (driven

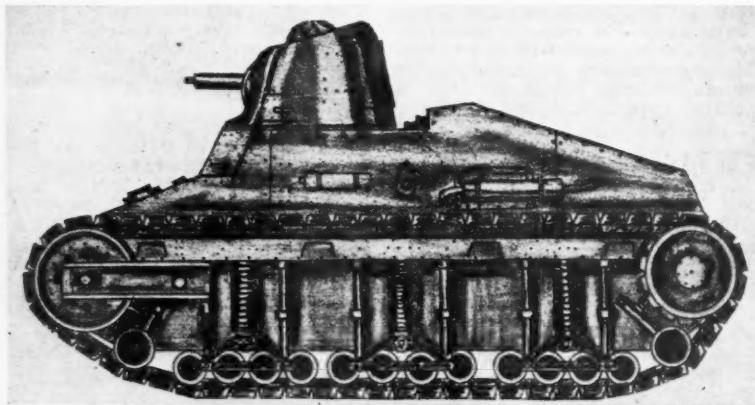


FIGURE 3.

appears in this model. The armament is variable; that which is shown is only one of the forms. In some cases also the rear machine gun in the turret is omitted but above all, the front surface of the turret is given more slope—since at the present time, tank armament which is not capable of meeting the attacks of low flying aircraft in a split second is badly deficient.

This and similar types of tanks proved their worth fully in the hands of the Japanese in their battles for possession of the Chinese cities which were stubbornly defended, for in China as in Spain, it was shown that destroyed cities with their masses of wreckage, are able to delay the progress of the aggressor for days when use is made of them by the enemy in delaying operations.

The small "Etsu" tank was also used in China as is shown by photographs, a tank which was developed from the modern French tank, the Renault NC 27 (see Fig. 3). Although this light tank is still in use, it is no longer being constructed. During the last few years a light tank has been developed by the Japanese whose performance is considerably superior to that of the former tank, whose outward form meets the most modern requirements and whose robust running gear considerably increases its value in

the universal tank, the Carden-Lloyd MK. VI (Fig. 5) which is likewise characterized by its robust construction.

This tank (like its Italian prototype) has shown its value in its special employment here and there as a flame thrower

by both rear axles, single steering) and its relatively simple armor, a type of the modern, though not most modern tank. The arrangement of an antiaircraft machine gun with appropriate mount and operated from the turret hatch-way, has been improved at the present time. The great slant of the front of the turret provides for adequate elevation for combating aircraft.

The second tank, of Japanese design (Fig 7), was developed especially for the

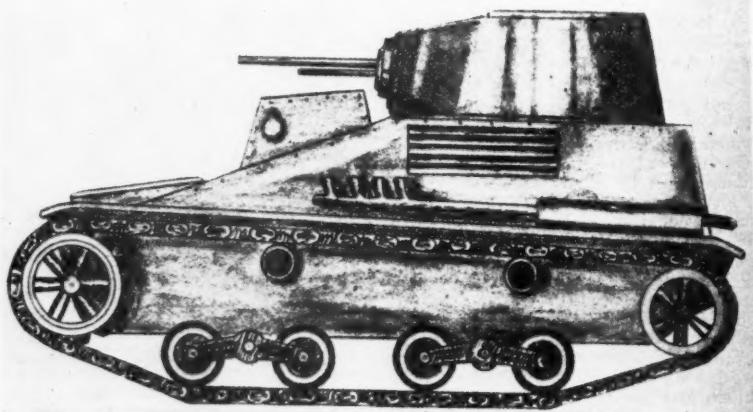


FIGURE 5.

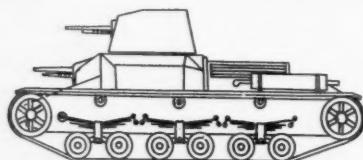


FIGURE 4.

the field (Fig. 4). The body of the tank appears to be a hundred percent welded job since no rows of rivet heads are to be seen. Its high maximum speed and its relatively low weight adapt it apparently, for use with "fast" divisions. Whether it is supposed to be taken to the place where it is to be used on a rubber tired recovery vehicle, or in a truck, when considerable distances have to be covered,

or self-propelled caterpillar mount. Reports concerning this employment vary but authoritative reports may be forthcoming. Japan has no heavy tanks at the present time.

In the constant highway battle of the Chinese war, and when employed for

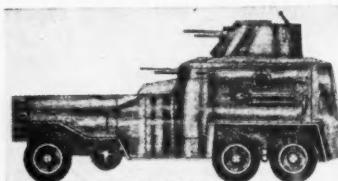


FIGURE 6.

Far Eastern theater of war. The six-wheeled tank, the Sumida, is a highway tank. It can also be used on railway lines. It takes but a few minutes to make the necessary change in the wheels. It has been of great service in securing the long stretches of railway in Manchuria, and on account of its ability to take to the highways in case of destruction of the railway lines, it is able to furnish effective security to railway construction troops. Its large body capacity also makes it valuable as an auxiliary vehicle in the supply service. By the use of machine pistols or light machine guns through the firing ports of its body, its fire power is considerably increased and it becomes particularly suitable for use against bandits.

The Ear of the German Army—The Signal Corps

[An article by Colonel Pleger appearing in *Deutsche Wehr* 10 April 1942. Translated from German at the Command and General Staff School, Fort Leavenworth, Kansas.]

During the present engagements on the eastern front, the signal corps units have had an important part in the successful cooperation of all units.

Often with gun in hand, the signal troops work tirelessly to see to it that the connection remains intact with the headquarters of both higher and lower units and that the troops are kept, by this means and in spite of many untoward circumstances at times, constantly under the guidance of the command.

The trouble-shooting troops carried on their important task, day and night, through snow and storm, through cold which at times has reached 40 degrees below zero (10 degrees below zero F.), and often through country occupied by the enemy.

The radio stations also, when a wire connection was broken, have contributed their part in the successful defense by taking up the task of maintaining communications.

That was the statement made in a radio service report of 12 February, 1942.

This report draws the attention to a troop of which very little is said, in a public way, but which is of the greatest importance in war activities and operations.

War communiques frequently mention the close cooperation of the three sections of the armed forces, the "army, air and naval forces," which has brought about such amazing success in the case of the German, and now of the Japanese armed forces in their blitzkrieg operations.

Just how it is now technically possible to command such gigantic forces? How is it possible, that the army, as well as the air forces, are able to work in such a unified manner and that our Führer is able to conduct the operations on the northern, central and southern group of armies as a single unit and that in addition, he is able simultaneously to send out orders to his troops along the French coast, the Spanish border, in Norway, Crete, Greece and Africa and is able to handle and govern in both a military and political way, his enormous Great German Reich?

This is possible only because of a great well-constructed system or network of communication lines, of telephone and telegraph cables and radio communications reinforcing and complementing these.

Profiting by the experiences of the World War, far-sighted and capable men slowly and quietly built up a communications group in the army and air forces. This was done with the cooperation of the electrical industries, and the Reich Postal Service helped in the selection and designing of apparatus and conductors which give the service of great stable networks, yet in their constructional characteristics are fitted for use in the field.

Above all, as a result of the experiences of the occupation of Austria, the Sudetenland, Czechoslovakia and the first of the campaigns, long-distance apparatus developed which permits speech over the great distances required by the far-flung theaters of war.

The radio apparatus was constantly improved so that at the present time it is possible, for example, to talk from moving tanks. It is only because of radio

that it is possible to command "rapid" and motorized troops at all.

The commander of a tank group is now able to remain in the lead with his troops in a special tank, for he can remain in constant radio contact with his staff and his division.

General Rommel's commander's tank is well known. It is equipped with modern radio apparatus, accompanies him everywhere and makes it possible for him to be anywhere his presence is needed in order that the effects of his commanding personality may be felt in every spot in the desert theater of war.

It is also well known that it is possible to talk from plane to ground, that is, from the plane to the directing ground station; or from plane to plane.

In the case of the great encirclement of the eastern front, success is due, in addition to able leadership and the bravery of our troops, in large part to this faultlessly functioning piece of equipment which serves alike in command and communications and which is installed and operated by the communications troop, the "command troop."

Back of every army group, army, and tank army, and back of every army corps and tank corps, trunk lines are built which make it possible for the particular commanders to keep in contact with the army general headquarters and the Führer's headquarters at any time. From the army high command, the GHQ and the divisions, other lines run even to the most advanced scouting troop. In addition to this there are lines crossing between the various and more important command posts.

For the construction of these great telephone and telegraph net-works, communications regiments are at the disposal of the various headquarters, the army groups and armies, while army corps and divisions are provided with correspondingly organized communications battalions. In addition, special so-called troop communications units are assigned for duty with the infantry, the artillery, tanks and other troops.

In addition, there is a great ground communications network operated by the air communications troop from the headquarters of Field Marshal Goering running to the various air force district headquarters and air fleets. From these places the lines run to the groups, squadrons and to every air field. There are also air-raid warning networks, and many other special networks.

The areas conquered and occupied by our troops in the East, are becoming continually greater. They are already greater in extent than the whole of Germany. The tasks of our communications troops increase every day. They increase as the distance from the homeland increases and the progress of the lateral extension of the fronts. It has been necessary to construct long-distance apparatus for use over heretofore unheard-of distances. Distances of 1,000 kilometers (about 600 miles) are no longer rare. So far they have all worked beautifully, thanks to the excellent construction of the lines and the improvements in the communications apparatus: for instance, the employment of tuned field cables, the use of amplifying cars, alternating cur-

rent telegraph apparatus and above all, the carrier frequency axes, which make it possible to carry on several conversations at the same time on a double conductor with a saving of an endless amount of labor, time and material. It is possible for both the army and air forces to speak or telegraph all over Europe with the help of this apparatus. Conversations from Smolensk to Paris, from Narvik to Bordeaux, from the Führer's headquarters to Rome, Belgrade, Bucharest, and Athens, are no longer uncommon.

If any further proof was necessary of the need and importance of the communications service, it has been provided by this time in this great theater of war.

As in no previous theater of war, there exists in Soviet Russia the continuous threat to the lines and the possibility of their being destroyed by the enemy. When the front is penetrated, the Russians remain for days and weeks in the forests and attack the German troops as guerrilla riflemen. It is common that straggling Russian soldiers band themselves together and attack the signal operators sometimes causing many casualties.

Since the soldier of the communications service performs his construction work near the front lines with the combat troops, he is often forced to fight for right of way with his rifle. Also, as a result of the encirclement of the Russians by our "fast troops" and tanks, the enemy often shows up suddenly in the rear and on our flanks so that serious fighting frequently develops.

The air communications troops also are often forced to fight their way with guns to the field air ports and to defend their equipment and ground radio stations from guerrilla attacks by the Soviets.

The work of our plane radio operators who are fighters (machine gunners) and radio operators at the same time is beyond all words of praise. The work of our tank radio operators who occupy a particularly responsible and important position should be mentioned especially. These men carry on calmly in the narrow confines of the tank which is filled with smoke and fumes and the eternal roar of the motor and guns. It is these men who make possible command of the tanks and their employment in close engagement.

Pack radio troops accompany the assault troops of the infantry, scouting troops, engineers in the demolition of bunkers, reconnaissance detachments feeling their way ahead in the enemy's territory, the observation posts of the artillery and maintain the contact between the foremost fighters and the command post of the unit.

Thus the communications troop is a combat troop the same as all other arms, and much interesting and instructive material is to be had from the stories of the engagements of these units. They have proven that here also they can take it. They have what it takes whether at the front in the defense of their construction staff, in the rear in combat with partisans, in the midst of assault troops or in a tank attack.

The lines for the army groups and armies were laid in territory which even the German soldiers had never trod. For several weeks a radio company was engaged as an infantry combat company along with a tank division. Many a grave bears witness to the fact that there is no part of this enormous area where communications troops have not laid down their lines, kept them in order, fought, and when fate willed it so, laid

MILITARY REVIEW

down their lives in the discharge of their duty.

The tasks of the communications troops are especially hard in the severe Russian winter. It can hardly be imagined what it means to work with wires up on the poles when the temperature is from 30 to 50 degrees below zero (22 to 58 degrees Farhenheit) and with the snow blowing. It is an extremely hard task, also, to "shoot trouble" in the complex network in these extremely low temperatures—and at such times troubles are particularly prevalent.

A few figures may give an idea of the enormous task of these troops. During the first quarter-year of its employment on the eastern front, the communications troops constructed some 600,000 kilometers (about 375,000 miles) of telephone lines. In comparison with the earth's circumference, this means that the bare wire and ordinary and long-distance field cables would have been sufficient to encircle the earth 15 times at the equator. It would not be anywhere near possible to form a conception of the number of conversations which were car-

ried on over these lines. There are only a few figures to show this. Thus the commander's exchange of an army corps communications battalion counted 100,000 messages which were sent over the lines in the three months' period. The number of teletype messages sent over the entire network of the eastern front during this same period was about 1,250,000. The length of these teletype messages would be equal to the earth's radius. The radio transmissions of the mobile radio formations on the eastern front during this same period amount to an equally impressive figure. Altogether, the radio stations of the communications troops sent out some 1,800,000 messages. An average of some 18,000 radio messages per day were transmitted through the ether, therefore. These constitute truly enormous accomplishments of the communications troops on the eastern front. The cooperation of the German with the Finnish, Hungarian, Spanish, Italian and Rumanian communications troops is excellent, and this is aided by uniformity both in organization and equipment.

Some Remarks Concerning the Use of Aviation in Combat

[From *Combat Experience of the Red Army Air Force*. Translated from the Russian in the War Department, Washington, D. C.]

Experience of the Red Army Airforce in actual combat on the front, has shown that the air staff must be accurately informed concerning the equipment and technique of the enemy: this refers particularly to pursuit pilots and aerial gunners. The crews studying the characteristics of the enemy machines, must ferret out the parts of the machines which are most vulnerable to gunfire. At the same time it is also necessary to take into account every new feature which the enemy has introduced into the construction of his plane or its armament, and all changes in tactics.

As a rule the pursuit flyer will attack the enemy bomber from behind, and in the opinion of most flyers, he should attack his tail, that is, he should plan it so as to approach in a sector not exposed to the fire of the radio-gunner. After having assumed such a position it is necessary to aim methodical short salvo fire, first against one motor, and, when that is disabled, do the same to the second motor.

In executing such an attack it is not necessary to execute a number of advances and attacks. It is sufficient to stand at the necessary distance and keep exactly on the tail of the enemy plane, cutting off all his attempts to get away from the fire. The value of this method has proven itself many times in practice.

Knowing the least protected places and objectives of the planes and motors, many pursuit flyers readily undertake a frontal attack. This latter usually takes place from below, and at the same time from the side at an angle of from 35-40 degrees. In this position the pilot and the bombing gunner cannot aim their fire against the pursuit flyer, and at the same time, the enemy flyer, protected neither by armor nor by fire, presents a very good target.

In their encounters with bombers, pursuit flyers frequently make a direct frontal attack. After he has decided to do this the flyer tries to fire the first

salvo of aimed fire against the pilot so as to disable the front machine gun, and then destroy the pilot. Sometimes it is not possible to do that in the first frontal attack. In such a case it is best to go directly under (under the belly of) the bomber, flying a little lower. Then pulling to the side he can repeat the frontal attack, or can attack the tail, directing aimed fire at the motors. Such a maneuver is profitable because neither the pilot nor the gunner of the enemy plane is able to direct any kind of effective fire because of the great speeds and the considerable angle of the turns. The turning takes place behind the bomber's tail, in the dead angle.

Very frequently it is necessary for the pursuit flyers to engage in combat with enemy pursuit planes, and in that case fundamentally the same methods are employed which were discussed above.

When fighting pursuit planes, excellent results are obtained by adopting the frontal attack; the enemy fears this and can never hold up against it. Practice has shown that very good results are obtained by combining maneuvering operations with speed. First the fight is engaged in on a horizontal plane. Then the enemy plane tries to avoid the attack and transfer the fight to a vertical plane. At this moment the attack of fast pursuits is extremely effective.

The enemy is also learning lessons from air combat, and aims to study the planes of his enemy, and then change accordingly this or that method of air combat.

Very frequently the enemy, not wishing to make a direct attack, resorts to all kinds of tricks. It has been observed that enemy pursuit planes fly in the clouds not far from field airdromes and await the moment when pilots return from their combat missions. Then they attack counting, it seems, on the fact that during their flight the planes had spent their ammunition and fuel. Sometimes the enemy would send one or two planes to simulate a bombing attack or combat

action, and to draw to themselves all the attention of the pursuit planes. Then, when the battle begins there appears the main body of enemy planes, assigned to attack the given objective. It also happens sometimes that the enemy planes pretend to leave the fight, and when our plane takes up the chase, a second enemy plane steals toward it. In such cases mutual assistance in battle plays, of course, the greatest role.

From time to time the enemy changes his tactical methods, and therefore a timely knowledge of the enemy's methods is essential and of prime importance to the pilot. The basic qualities of a pursuit flyer are skillful maneuvering and accurate fire.

Experience on the field of battle has demonstrated that an important element in maneuvering is the approach toward the objective. When the pursuit flyer has sighted the enemy and takes off from the airdrome, he must judge the conditions—at this moment it is necessary to take into account the weather—quickly decide where and in which direction the enemy is flying, and make his decision accordingly. Often the decision will be something like this: it is necessary to cut across the enemy's line of flight and meet him from the side of that cloud where the enemy plane is hurrying for cover. By such a maneuver the pursuit pilot places himself in a very advantageous position. After having chased the enemy out into the clear it is easy to destroy him by a decisive attack. Of course, it is necessary to take into account the type of enemy craft, and to make one's plan of attack accordingly.

In approaching a dive bomber it is necessary to prolong one's flight in the clouds, then come down to observe where the enemy plane is, then again get into the clouds, chase him, and attack from the clouds. The dive bomber usually does not take up battle, and tries to escape to his own territory. If he cannot do that, that is, "take to his heels," then to save himself from the pursuit he tries to place the pursuit plane under the fire of his gunner. As soon as you have caught up with the enemy plane it is necessary to attack his tail from this side, at an angle of from 30-35 degrees, and destroy the machine gunner. If the enemy plane assumes an angle toward your side, then you in your machine will be in an extremely unfavorable position, as the enemy gunner has a chance to shoot at you directly in front of him. Therefore, if you get into this position, you must counter by lowering your machine to the plane (geometrical plane) of the bomber, and then you will succeed in shooting the machine gunner of the enemy through the edge of the fuselage. After finishing this part of the combat you should center your fire on one of the motors. It is necessary to fight methodically, insistently, and to reckon with the amount of ammunition used up, as it is important not to forget that very likely it will be necessary to shoot at the second motor.

To fight successfully against dive bombers it is necessary to know their vulnerable places, which appear to be: the motors and the gasoline tanks situated in a plane (geometrical). Taking into account the fire of the dive bomber it is best to attack him from the tail, but not at an angle of 0 degrees, but a little from the side and slightly from below in relation to the plane of the airplane. It is also possible to attack from the side and from above, but this position is less

FOREIGN MILITARY DIGESTS

advantageous, and is taken only when forced.

If it happens that one pursuit plane has to fight two enemy bombers, then the method of attacking is as the one mentioned before; only in this case it is necessary to get close to the enemy, so that while shooting at one enemy plane you use it as a cover against the other. The important thing is not to scatter your fire against many targets. After having picked your target, fire away at it, until you have accomplished your purpose.

The fight against an enemy pursuit plane is somewhat more complicated. Here it is especially important not to get excited, to weigh all possibilities, to maneuver skillfully, and to fire accurately. In the last analysis success in aerial combat depends on accurate shooting. The approach toward the objective, the maneuvering—all these are only methods and ways, with the aid of which the flyer gets into a favorable position for firing at the enemy. A plane is not stationary, but is constantly turning at tremendous speed. The time during which you occupy this or that favorable position is reckoned in seconds. The task of every gunner is—to seize upon that moment, and to make use of it with maximum effect. Never should you start firing prematurely at long range. That is almost useless. Not only that, but at the very climax of the battle you may be left without ammunition. The pursuit flyer's most effective range is from 100-400 meters.

Experience teaches that firing accuracy in the air depends on the speed of finding the target at which to aim. The gunners should not fire at the enemy plane at random, but should aim at a definite, and most vulnerable point. It is best to feel out the target first with ordinary shells and then let go with armor-piercing bullets and incendiaries.

Some Remarks on Secondary Missions of Pursuit Planes

Combat activity of the pursuit planes on the front has shown that this branch of aviation, besides solving its basic task—destroying enemy aviation in air combat—can, with good military success, fulfill a number of other tasks of the command. These secondary tasks of the pursuit plane may be: air reconnaissance, assault attacks on various kinds of objectives, from heavy enemy columns to such objectives as railroad trains and enemy infantry in trenches. Some are skeptical regarding the raising of such tasks for pursuit planes, but all experience on the battle fields has demonstrated the effectiveness of some of the methods of pursuit planes in reconnaissance and in assault action.

Speaking of reconnaissance it is indisputable that in a single-seater it is not possible to get such full reconnaissance as is possible for the crew of a many-seater plane. But it would be a serious error to deny completely the effectiveness of reconnaissance accomplished by pursuit planes. It all depends on the correct assigning of the missions, and on the technique of fulfilling it used by the reconnaissance plane. The reconnaissance mission of the pursuit flyer should be limited. To overburden him with many reconnaissance objectives is to give him a task too difficult for him, and to lower the effectiveness of the reconnaissance.

The pursuit flyer should be trained in the quick recognition of the details of the objectives to be reconnoitered. Elaborate care should be taken to teach this to pilots. The commander, as a rule, receives an oral report of the reconnois-

sance, given usually from memory, and he must demand of the pilot that the latter describe as accurately as possible the outside appearance of the reconnoitered object, configuration of the discovered column, its color, the order in which the column is moving, etc. Experience has shown that training the pilots to turn their attention to camouflaged points of the observed objectives helps avoid the errors which are so likely in a war of maneuver.

On the basis of experience it was shown that pursuit planes can do reconnaissance most effectively when flying in pairs. While the leading plane reconnoiters the ground, the other plane has the mission of giving it protection and of reconnoitering the skies. The method of flying in pairs was adopted by many pursuit units and proved itself completely.

With proper organization the pursuit planes can do reconnaissance not only in behalf of their own aviation, but also for safeguarding the operations of army units (contact) in general. More than that, flying over the field of battle they frequently corrected the fire of their own artillery. This was done with the aid of a laringophone. With it the pursuit flyer gave information on the deviation of the shell hits from the target. The evaluation of the deviations took place without coordinates or maps. Knowing the plan of fire the flyers by successive correction led to a complete covering of the target with fire. It may also be added that this refers to fire against stationary objectives as well as against moving ones—columns of infantry, automobiles, and tanks.

Sometimes pursuit planes may be used successfully as ("Shturmovki") assault flyers, and it may be added that this method of employing pursuit planes is used quite frequently. Usually aviation specialists are of the opinion that the best way of achieving a surprise attack is to approach the objective while flying low. However, this is not necessary for all types of pursuit planes. Everything depends on the character of the objective and the configuration of the landscape where it is situated.

It is very important not to make a mistake in one's calculations and to approach the objective with maximum accuracy. It goes without saying that for pursuit planes this involves known difficulties, but in order to avoid them it is possible to employ the method of "pre-reconnaissance." This takes place in the following manner: Having flown over the line of the front the commander of the unit sends his substitute ahead, and himself stays in the section about 12-15 miles from the place from which the objective is approached. A few minutes afterward the substitute returns and leads the group to the discovered objective.

Generally in attacking the retreating units of the enemy one should not do without the "pre-reconnaissance," con-

ducting it even in the following manner which does not give bad results: Having received the assault mission in a specified sector the commander first sends out two or four planes. After flying into the enemy's rear the flyers determine along just which roads the main columns of the enemy are moving, storm one of them and cause a tie-up on the road. Then they quickly return to the airdrome, briefly report to the commander on what has been observed, and then the main body of planes goes against the objective.

In fulfilling such a mission the assault planes usually approach their target at a height of from 1000-1200 meters; this height makes it possible to take better aim for the attack, and at the same time safeguard against the antiaircraft fire. At the very beginning, when going into the dive the pursuit flyers start fire from their guns, and when coming out of the dive they release their bombs. This method of attack makes it possible to spread the fire more evenly over the entire target.

The formation of the attacking planes should be quite scattered. In attacking troops on the road a very effective formation is that of the "bearing" (?) or "S-ing." In storming troops in a defile or populated points the best formation is that of the wedge. In the combat order some planes must be assigned the specific duty of destroying the antiaircraft guns.

At first the opinion prevailed that the planes assigned to destroy the anti-aircraft guns of the enemy had to fly at the head of the column, in the van of the attacking unit, and clear the path for it. But combat experience has shown that for better insuring repeated attacks with pursuit planes, assigned to silencing the antiaircraft guns, it is sometimes better for them to fly in the tail of the group. After ascertaining before the first attack the location of the anti-aircraft guns, the flyers have time to silence them more surely for the second approach to the objective. Sometimes the enemy troops cover themselves with patrols of pursuit planes; for this reason, during the time of attack, and also, especially, at the time of leaving the objective, it is necessary to have a careful look-out in the air. The enemy tries to gain easy victories, and to attack a plane which is away from the others. For this reason a compact withdrawal of all planes from the attacked objective, seems indubitably the best tactical method.

During the attack the troops require assault action by pursuit planes against the enemy's front line of defense. Experience has shown that having first silenced the antiaircraft guns, the pursuit planes can in repeated attacks press the infantry in the trenches, silence guns of all kinds, and in this way give substantial help to the friendly infantry before it goes into the attack.

Combat in Mountainous Terrain

[From the *Field Service Regulations Soviet Army, 1935.*]

The nature of operations in mountainous terrain will depend to a large extent on the particular conditions prevailing in the mountains and also on the climate.

Among the principal features here encountered will be the following:

a. Deficiency in lines of communication, especially roads suitable for vehicular travel; special deficiency in good transverse roads.

b. Close country, involving greater exertion on the part of troops than required in open terrain;

MILITARY REVIEW

- c. As a rule, sparsely settled with scant local resources;
- d. Varying climatic conditions at different elevations;
- e. Great influence of the season of the year and weather conditions.

Success will be influenced by the special training and preparation of troops, their familiarity with mountain tactics, the proper supply organization and equipment of troops. Where troops employed in mountainous terrain are not accustomed to mountain warfare, officers experienced in mountain warfare should be assigned to them and all necessary measures adopted to acquaint the troops as speedily as possible with the same.

Mountain operations are usually undertaken with small formations made up of various arms of the service. Detachments frequently operate separately, isolated from one another. Because of this, the original disposition of forces assumes especial importance. Commanders must possess great initiative and they must exercise utmost vigor in the execution of assigned missions. The organization of detachments should be such as to enable them to operate with complete independence.

Fighting in mountainous terrain is carried on primarily for the possession of commanding heights, mountain passes, ridges, road centers, etc.

Infantry troops are most suitable for mountain operations; mountain units are employed in more difficult sectors.

Where the terrain is particularly hilly, the cavalry operates dismounted.

Mountain pack artillery supports the infantry and cavalry action in all situations. Control is decentralized, as a rule. Trench mortars assume especial importance in mountain warfare. Where suitable lines of communication exist, howitzers (horse-drawn, motorized and self-propelled) should be employed.

Tanks may be employed successfully in mountain warfare by units up to the battalion in size, except in the case of particularly difficult mountainous terrain and inaccessible areas. The rate of movement will be retarded and the expenditure of fuel increased. In defensive actions, approach routes should be improved for the tanks.

Aviation is highly effective for attack purposes in mountain warfare (bombing planes); planes are extensively utilized on reconnaissance, transport and communication missions. Proper use must be made of reconnaissance planes for artillery fire adjustment and aerial photography to adjust the fire of the artillery and to correct maps which are often inaccurate in mountain areas. Ground troops are required to find landing fields, and to clear and prepare them in mountain country for use by aviation. Mountain lakes may be used for the landing of planes with the aid of floats. In view of the special flying conditions in mountainous terrain the flight personnel should receive special training or at least be properly acquainted with the nature of the particular flights.

Chemical and engineer troops as a rule support each independently operating force. The principal task of engineer troops in mountains is to carry on demolition and road work.

When preparing for a march in mountain country it is important to make a careful survey of the nature and condition of roads, to prepare a march schedule, to draw the route of march on the map, and decide on the composition of columns and their order of march in accordance with the existing situation.

The rate at which columns will march will be somewhat as follows: over vehicular roads with a grade of 20°—two to four kilometers per hour; where the grade is in excess of 20° the rate of march will be much slower. The duration of a march should not exceed 10 hours per day. Columns are divided into echelons (company with machine guns). Leading echelons are supported by artillery, sappers, chemical troops and absolutely necessary transport elements, made up primarily of packtrains. It will often be wise to split up the artillery on a march among the companies by batteries or even by single guns. In order to avoid crowding among columns, intervals of space between echelons should be such as to involve 10 to 15 minutes travel. The cavalry and tanks march in separate echelons. Long halts are provided for after six or seven hours' march. Brief halts (of ten minutes) are made each hour (after fifty minutes' march). In addition, at steep hills two or three-minute halts are made after fifteen or twenty minutes' march.

A march in mountainous terrain calls for an even, flexible, slow pace, especially in the case of troops with full equipment.

At long halts the loads are taken off the animals.

When traveling down hill, the artillery and transport proceed at a slower pace than the infantry. On steep descents measures must be taken to hold back the transport and equipment and to aid the animals in getting down hill.

March security is provided for as follows: a. By the use of advance detachments or outposts; b. By flank security detachments (mobile and stationary); c. By rear guards.

Advance detachments are sent out when the nature of the column requires it, and in instances where there is the likelihood of encountering an active and strong hostile force, where there is the danger of coming upon an ambuscade in force while on the march, etc.

The distance of the advance detachment from the main body will not be the same even during a single day's march; it will depend on the need for occupying commanding heights along the route of march of the column in order to afford complete protection of the main forces.

It is well to assign cavalry elements to the advance detachment; it is essential to assign to it artillery (single guns, at times), chemical elements and sappers.

Flank protection during a march in mountainous terrain assumes especial importance. Stationary flank security detachments (with machine guns, and occasionally also with single artillery pieces) are successively sent out in advance to occupy commanding heights along the flanks of the route of march, which detachments, after permitting the entire column to pass, fall in at the tail of the column. Where the situation and the nature of the terrain is such as to permit this, it may suffice to send out only mobile flank security detachments.

Where the danger of a flank attack exists, flank security detachments will be sent out before the advance detachment gets under way.

Disposition for rest is usually in bivouac by echelon in approximately the same order as the columns are formed for the march. Security is provided by stationing individual outposts on commanding heights affording a good view of the disposition of the resting forces.

The object of an advance in mountainous terrain is to gain the flank and rear of the enemy by the seizure of commanding positions, mountain passes and road centers, to the end that the enemy may be surrounded and destroyed. *The solution of each and every offensive action should be sought by means of the envelopment.*

In order to seize routes and mountain passes it is necessary to gain control of the commanding heights in their vicinity and by means of a rapid enveloping movement to gain, even if only with small forces, the other side of the ridge, in rear of the defender. A vigorous offensive must at the same time be launched against the pass frontal by the containing group. Our own flanks must be properly protected by means of reconnaissance and security forces during the advance.

A defensive force in mountains should take firm possession of all routes leading from the direction of the enemy and of commanding heights. The directions from which the enemy might effect an envelopment of the position, as well as any gaps between strongly held areas, are occupied with small units (platoon, company, squadron) and carefully reconnoitered. Barriers must be prepared in front of the defense zone on all routes leading from the direction of the enemy. The system of infantry and artillery fire is arranged so as to afford cooperation between lateral and flanking forces and to insure action against approaches and dead space. Special importance in mountain warfare is assumed by curtain fire of infantry weapons and artillery, the employment of tiers of fire and the use of hand grenades, rifle grenades and explosives. The antitank defense system should be such as to insure the destruction of any hostile tanks while they are climbing the hills.

The number and disposition of assault groups will be determined by the possible directions from which the enemy may undertake an envelopment and the suitability of the terrain for launching counterattacks (it is advantageous to counterattack downhill).

Assault groups should be reinforced with tanks. Reserves are placed at road junctions.

Communications are maintained in mountainous terrain by radio, flash signals, sound and visual signals, by plane, mounted and dismounted orderlies, by automobile and motorcycle.

Antiaircraft defense in mountainous terrain is provided for in accordance with the basic principles of such defense. Observation and warning are maintained at high points affording the best view and fire positions. Road junctions are the first to be afforded protection. The antiaircraft machine gun is the best weapon for use here. The march of troops, particularly that of the cavalry, tanks and transport, through defiles and passes is covered by pursuit aircraft. Men should be trained to take cover promptly in safe spots—largely available in mountain areas.

Proper provision for supply and maintenance during operations in mountain areas is of decisive importance. The most important task of troops and supply agencies is that of the immediate improvement and development of roads both behind the advancing forces and in the rear of the defensive zone. Where vehicular roads are available, packtrains are replaced by animal-drawn and motorized transportation.

Some Aspects of Forest Warfare

[By Lieutenant Colonel N. G. Pring (A.I.R.O., M.A., I.F.S.).
In *Journal of the United Service Institution of India* October 1941.]

The various types of forest, including tropical evergreen, savannah, thorn or scrub forests of the sub-tropics, deciduous and coniferous woods of the temperate and Alpine zones, high forest and coppice, deserve separate treatment. They can, however, be combined in respect of two common factors: i.e., the cover they afford to armies and the check they impose on maneuver.

The Germanic tribes owed their successful resistance to subjugation by the Romans to their forests, for although the Romans possessed the finest army in the world, including superb infantry, they never succeeded in holding the country across the Rhine for any length of time.

During the thirteenth century the Mongol hosts swept across the Steppes of Russia and ravaged Poland, but although they defeated a mixed army of Poles and Germans at Liegnitz, they did not continue their drive westward because the woodlands and hilly country did not suit the tactics of these mounted hordes. The forest is essentially the infantryman's sphere.

One of the chief roles of woods throughout the history of modern war up to recent times was that of security for the flanks; two typical historical examples are afforded by the Battles of Blenheim and Malplaquet.

At Blenheim the Franco-Bavarian Army, although surprised by the decision of the Allies under Marlborough and Eugene to attack, were in a sound position with their right on the Danube and their left on wooded hills. The French Army under Tallard, holding the right and center, was utterly defeated and it is with the left wing under Marsin and the Elector of Bavaria, opposing Eugene, that we are concerned. The difficulty of the ground between the French and Imperial Forces had delayed Eugene's advance and his cavalry achieved little that day. Fighting at odds, Danes and Prussians were able to advance amid the bushes of the foothills and push back the French left two miles; but Marsin's forces were not outflanked, and he and the Elector were able to retire in good order and actually rescued some of Tallard's battalions, which had already surrendered. Without the security of the woods the French left flank would have been turned and Marsin's army would certainly have been pursued, and probably most of them captured.

At Malplaquet woods formed both flanks of the French position. Admittedly, this offer of an excellent defensive position was a gambit which Marlborough and Eugene felt it necessary to offer in order to induce Villars and Boufflers to accept the challenge. The Allies were superior in numbers and equipment, but the French, on meager rations, were brave and experienced fighters recognizing in their leaders the foremost captains of France.

The allies achieved their design of first weakening and then breaking through the French center by their attack on the wood of Taisnieres. This attack and subsequent advance through the wood was achieved by one of the heaviest infantry concentrations in history—no less than 85 battalions were employed on this wing at the commencement of the battle where the French were outnumbered by four to one at least. Subsequently, both

sides drew reinforcements from the center. On the other wing, with their left flank in the wood of Lanieres and with the able support of batteries concealed behind the small wood of Tiry, the French were able to repulse and counterattack the Dutch and Scots. On this wing the Confederate infantry were only saved from rout by Marlborough's cavalry.

Europe was appalled at the slaughter of Malplaquet where the allied losses were nearly double that of the French. As a victory it proved singularly barren of results for the victors, indeed the result was to stimulate the French who retreated unmolested and unheartened. Undoubtedly, Villars had made the best of woodland position. As Churchill states: "Resting his wings upon the woods and covering his center with intermittent entrenchments, he presented a front which no army but that commanded by Marlborough and Eugene, with superior numbers and eight years of unbroken success behind them, would have dared to attack. He exacted from the allies a murderous toll of life by his entrenchments and abatis; but all the time he fought a maneuver battle around and among these created or well-selected obstacles. By a prodigy of valour, tactical skill and bloodshed they drove him from the field. The victory was theirs but no one of the allied generals, if he could have gone back upon the past, would have fought the battle and none of them ever fought such a battle again."

The combination of woods and mountains still offers exceptional defense. During the Great War the wooded slopes of the Carpathians prevented the Russians from invading Hungary and allowed the Austrian armies breathing space to reform after defeats.

The original Schlieffen plan recognized the difficulty of attacking via the Vosges, and the 1914 costly French attacks there achieved little and risked much. Judging by the events of 1940 the money and effort spent on the Maginot Line east of the Vosges could have been used to better advantage elsewhere and the densely-wooded Vosges would have formed a secure and economic defensive flank.

In wooded terrain the inhabitants play a very important role if they are of fighting stock. In the campaign that preceded Wolfe's victory at Quebec, both the French and British colonials were superior to the regulars; and undoubtedly Washington's colonials fought with natural advantage among the forests of the Eastern States. Again the Finnish Rifles were among the cream of the Imperial Russian armies and no one will deny them first rank among infantry of the world today.

One of the greatest difficulties experienced by the attacking force is the maintenance of contact.

During the battle of Tannenberg it was Von Francois's decision to string his corps along the southern edge of the forest area for a distance of 30 miles, thus preventing the escape of the Russian Army, that achieved one of the greatest victories of the Great War. Had Von Francois obeyed orders by attacking and plunging his corps into the forest instead of surrounding it, he would not have gone far nor achieved much; certainly not the

capture of 60,000 unwounded prisoners which fell to his share.

In March 1916, the dispersal of the German forces during the earlier attacks on the wooded heights in front of Verdun probably saved the situation for the French; in the confusion, the artillery of both sides was neutralized to the great advantage of the defenders, who were able to reform and reinforce their broken line.

Turning to small scattered areas of woodland, one should contrast the very costly frontal attacks during the Somme campaign on Manetz, Delleville, and High Woods, etc., as compared with their re-capture in the 1918 spring advance. Infiltration tactics obviously exclude frontal attacks on woods where this is avoidable.

For artillery, generally speaking, the forest favors defense. Targets are hard to locate and the difficulty of observing is much greater. In high forest the wastage of fire power through shells or splinters hitting timber is appreciable. The greatest handicap in offensive warfare is the uncertainty of the accurate location of targets and of the results of a bombardment. Wire and well-sited trenches can be kept invisible from the air. The creeping barrage loses effect owing to bursts on trees and if followed up closely is likely to cause casualties to the attackers. After the initial bombardment, the dispersal of the attackers in the wood and the difficulty of observation enhances difficulty of controlling indirect fire, and it is better to support the advance with mortars and light pieces that can be brought up with the infantry.

In spite of a great preponderance of guns, including French artillery, the American Army's gallant and strategically important advance through the forests of Ardennes in 1918 was one of the most costly attacks of the Great War because the observers could not locate wire and machine-gun nests hidden in the woods.

The defense will rely chiefly on direct fire by well-concealed light pieces. Wire and skillfully felled trees will force the advance into covered zones.

For anti-tank work, the defense will do best to rely on light high velocity quick-fires capable of being sighted and fired by one man. Above all he must be able to aim quickly because if he does not get the target quickly, the target will get him. The soundest solution would be to mount the anti-tank guns in tanklets capable of maneuvering within the forest and affording protection against machine guns.

The check to rapid maneuver within the wood applies particularly to cavalry and armored cars. The attackers are subjected to the risk of ambush, enforced concentration along vulnerable lines and general lack of cohesion. In the case of tanks, assuming that the defenders have the necessary armament, the advantage lies with the defense. Armored cars and tanks have, however, the several advantages of speed, range, and for their crews, comparative immunity from physical exhaustion, which reduces the property of woods as security. After a long outflanking march your cavalry would meet his opponent fresh for the charge. Now the same distance can be covered in less than an hour so that even though the defenders have the advantage of interior lines, a constant guard by them on their flanks and rear is necessary. The chief danger to the defense is encirclement. It is essential for them to maintain constant contact with the flank outside the forest, to prepare for counter-attacks to assist

MILITARY REVIEW

those flanks and to have plans to withdraw so as to avoid encirclement in case their flanks retire. The effect of enfilading fire from the forest on forces advancing along the flanks is very great. Instance the deadly effect of the fire from the edge of the woods at the Battle of Wynendaal (1708). Webb's task was to prevent a much superior French force under La Motte from seizing the precious ammunition convoy marching from Ostend. La Motte, debarred from marching round the woods if he were to reach the convoy in time, took the gap through the woods. Webb posted battalions in the coppice on one side and in the high wood on the other in advance of his main force with which he held the thousand-yard base of the gap between the woods. Webb, who had no artillery, and practically no cavalry, had to endure a three-hour bombardment before La Motte advanced in great depth. Fired on from both flanks as well as from the front, the slaughter was swift and heavy and the repulse of the French was utter. Were the same tactics employed under modern mechanized conditions, including the column, the tempo would change but the same result might be expected.

Within the forest the natural advantage of the defense is less conducive to counter-attack and the tendency of defenders sitting pretty is to stay put. The best opportunity for counter-attack inside the wood occurs when the attackers reach close quarters following a withering fire.

For the purpose of attack or counter-attack the great value of woods lies in their use as cover for assembly. Many instances of successful charge by forces concealed in or behind woods can be quoted. A classic example was the skillful deployment and disposition of Stonewall Jackson's brigade, when he rushed up to save the critical position on Henry Hill during the Battle of Bull Run. It was his Virginian brigade's subsequent charge from the woods that gained the victory for the Confederates, in this the first battle of the American Civil War.

The use of mustard gas or other heavy gases is feasible. During the Abyssinian campaign the Italians used it with marked effect, but against an enemy quite unprepared; the use of gas on a large scale in forest areas would be wasteful and it would be better to confine its use within the forests to known or suspected targets such as located batteries, road junctions and assembly points, etc.

Of the other ground weapons the mine is probably the most important and, combined with trenches and tank-traps, will make an advance through forests very costly.

Over vast expanses of tropical jungle and in mountain forest where transport is limited to boats, pack, sledge, or portage, supplemented in future no doubt by aircraft, the foot-soldier and his rifle come into their own.

With the development of the air arm, completely new conditions obtain, which appreciably alter the value attributable to ground warfare. From the ground a spinney or even a belt of roadside trees hides all behind it, whereas from the air the cover is limited to the forest and is no longer afforded by clearings. On the other hand, in many cases woods afford the only adequate cover from aerial observation and, where it is so, their value increases.

By night, concealment from parachute flares is a valuable asset to troops encamped and on the march.

From the ground, fire is directional and is limited to the range of weapons situated in enemy territory. The aeroplane can attack from the direction most suited and there is practically no range limitation. The fire hazard increases and is likely to prove a menace during dry seasons in many kinds of forests, particularly among pine and other conifers. Frequently, the only way to extinguish a forest fire is to counter-fire, and for this, experience is necessary. Owing to this new danger from the air, it will probably prove necessary in many areas to burn the ground or clear it of inflammable material around gun positions, encampments, etc., and along forest roads.

On the ground assaulting troops must get through the forest or round it past the defenders. From the air, troops can be dropped behind the enemy's lines and can take advantage of the forest to lie up until the time is ripe to participate in an attack.

Man has been waging war by land and by sea for thousands of years. Aerial warfare is really only just beginning and it would be foolish to try to draw conclusions at this stage. Certain it is that even in high forest tracks, the side having superiority in the air will have a tremendous advantage. Having gained complete air superiority, artillery fire on batteries and on camps in clearings can be accurately directed while bases further back and communications can be bombed and machine-gunned. Apart from purely offensive action aircraft is invaluable for contact and supply purposes in dense jungle country where lines of communication are few and difficult.

Finally, although observation and exact location may be impossible, aerial photographs, studied at leisure by experts, reveal a great deal that the eye cannot detect. Combined with a scrutiny of existing maps, including large-scale forest maps, aerial photography will play an important part.

Lee's and Jackson's operations in Virginia serve as an excellent example of skillful leadership where good use was made of the forest in attack and defense, but perhaps the finest example is afforded by Lettow-Vorbeck's East African campaign. The indomitable leader fought out the Great War, unreinforced throughout, against stronger forces constantly reinforced by men and materiel. The bush was his only ally and saved him from being rounded up on numerous occasions; but he made the fullest use of it for attack, gaining several notable victories. Aggressive to the end, he had successfully re-invaded German East Africa, from whence he had been driven, when the Armistice forced him to lay down his arms.

Mobility and the aggressive spirit count just as much in forest warfare as elsewhere, and it is the greatest mistake to regard the forest merely as a natural fortress. A skilled leader will use his woods for defense when opportune, but under modern conditions he must be ready for strategic advance or retreat as the occasion demands. He will use the cover they afford for protection, particularly

from aerial attack and observation and for concentrations preparatory to surprise attacks. When he attacks a forest position he will employ infiltration methods at the most vulnerable points, possibly from the flank or rear, certainly with every available artifice to avoid unnecessary casualties.

Suggestions are offered as follows:

Personnel.—The Empire can call on men from many of her Dominions with experience of the forest; and in India from among the Gurkhas, Garhwalis and Punjabis of the Himalaya are many who are at home in the jungle. Whenever possible, use them for forest warfare. A number of Reserve or Emergency Officers are available from the Forest Service and large timber firms. Some of these will be needed as engineers or for supply services, but the remainder can most usefully be employed with units engaged in forest warfare.

Information.—Most countries with forest services have brought their Crown forests and private estates under systematic management with working plans. These plans should contain much information of military value, including maps showing roads, paths and buildings not usually shown on ordnance surveys. The body of the plan also contains much that will be useful regarding local conditions, labor supply and information on the type of wood and the density, clearings, etc. All working plans are written in a regular sequence from which useful information can easily be extracted by a forester. Foreign working plans are usually obtainable in normal times.

Some of this information might be extremely useful to the R.A.F. for reconnaissance and raids. Where regular working plans or schemes are not available, reports and surveys of timber cruisers may contain valuable information.

R. A. F. Cooperation.—Prepare landing grounds and communication facilities where possible in advance. In dense jungle country, such as parts of Burma and West Africa, rivers are the highways; and reaches suitable for landing need to be selected and improved.

Post liaison officers to the R.A.F. as early as possible so that effective co-operation between ground and air forces is established without delay.

Training.—Specialist training in forest warfare may not be feasible, but woods could be included during tactical training and musketry practice. This is practical in most hill cantonments.

Rehearsal.—Whenever possible rehearse before an attack with the units actually employed. Let those who contemplate the planning of extensive night operations first try walking across country in a forest at night without lights.

Research.—In an article entitled "Military Research," Journal of the United Service Institute of July, 1940, AUSPEX draws attention to the need of such research. The battle grounds in Finland, Norway, France, and Belgium included much forest and the writer is convinced that a study of the technique employed by the various combatants would prove highly profitable.

A Royal Army Medical Corps Hospital in Crete

[An article by Lieutenant Colonel R. K. Debenham, RAMC.
In the *Journal of the Royal Army Medical Corps (British)* April 1942.]

A deliberate attack on an Army General Hospital must be a rare occurrence and suddenly presents unexpected prob-

lems in an acute form. It is evident that the enemy does not respect hospitals if the site is of strategic importance to

FOREIGN MILITARY DIGESTS

them, and a short description of the experience of a 600 bedded General Hospital in Crete may therefore be of value.

It was seven o'clock on the morning of 20 May when the attack on the island and hospital site was launched with intensity and suddenness; the tented hospital was bombed repeatedly and raked with machine gun fire from many aeroplanes. Free movement in the hospital was paralyzed and everyone who was in any way ambulatory was soon in a slit trench which affords excellent protection against such attacks and reduces casualties to a minimum. Dug-in tented wards are of considerably less value, but are helpful. The aerial attack lasted for about two hours and was followed by the appearance of many large troop-carrying planes from which about 300 parachutists descended on to a piece of ground a few hundred yards from the hospital. Most of the parachutists never reached the ground alive, or were soon accounted for, but a number of them came into the hospital, replaced the Red Cross Flag by a Swastika (this was soon rectified) and impounded all up-patients and personnel who could be found. These were collected together and were marched off down the road out of sight. (In point of fact, they almost all returned twenty-four hours later). Any movement from the slit trenches was followed by the whizz of a sniper's bullet. This state of affairs lasted for some time until the parachutists had been satisfactorily accounted for by the New Zealanders who reoccupied the area and during the rest of the day all was quiet on the ground though enemy planes paid frequent visits.

It was quite evident that the hospital area as such was a dangerous spot; so when all was quiet and dusk had fallen, all remaining patients (i.e. those who were bad cases and those who had not been discovered by the parachutists) were removed to safety into caves which were fortunately not far distant by the sea shore. From that time onwards the hospital became a "Cave Hospital" and work was carried on there.

Fortunately there were several good caves along the rocky coast; our faith in the protection afforded by the Red Cross had temporarily disappeared and it was decided to give the enemy no clue to the whereabouts of the new hospital. This made proper work very difficult; movement by day was hampered by the sudden and frequent appearance of aircraft and all major activities such as removing necessary equipment, collecting rations and so on had to be carried on under cover of darkness. The blackout also had to be considered.

The cave hospital presented new problems all of a sudden; the state of the floor needed attention as it had been frequented by goats and other animals. The irregular surface and strange slopes did not help the arrangement of patients though the slopes were useful when Fowler's position was indicated. No beds were available but patients can be made surprisingly comfortable on stretchers or mattresses. Such cooking as was necessary was done on primus stoves in a corner of the cave. There were five "surgical" caves and one "dysentery" cave. Each cave was responsible for its own cooking. Rations were distributed beforehand and a central dump or Quartermaster's Stores was established in a convenient spot under an overhanging ledge of rock.

The severely wounded patients and the new cases requiring operations were

collected into the largest and best cave and here an operating table was set up and necessary surgery carried out both for our own people and for wounded German prisoners. The patients were magnificent; they never grumbled though it was difficult to give them a fair deal. Cramped space, poor light, awkward slopes, and lack of proper hygienic arrangements made work difficult. Water was carried from a well some distance away and had to be carefully conserved. There was fortunately plenty of sea water a few yards away, and the sea was useful for the disposal of excreta. Incidentally a corpse which had been laid outside the cave till burial could be effected at night was fired on by machine gunning from the air.

On 23 May a New Zealand Field Ambulance, falling back with the Division, formed a Main Dressing Station in a building nearby which had previously been used as the Hospital Officers' Mess. They reported that their Red Cross flag had been completely respected and from that time onwards a large Red Cross was displayed over the caves most of which were conveniently near together and all the work was carried on in an ordinary way, quite openly, irrespective of the presence of enemy aircraft; the Red Cross was absolutely respected except when one of the trucks belonging to the Field Ambulance and bearing the Red Cross was deliberately attacked by cannon from the air and destroyed.

The Field Ambulance M.D.S. and the

Cave Hospital thereafter worked in complete cooperation; wounded were evacuated and new cases admitted; at least 500 patients were housed in the caves. It was most unfortunate that, during the first hour of the attack, both the Hospital Medical Store and the Dispensary were completely destroyed by fire so that equipment was short and many important drugs were unobtainable. It is interesting to note that, in spite of the impossibility of giving A.T.S. (it had been destroyed), the subsequent incidence of tetanus was negligible no doubt due to the previous administration of toxoid. The lesson to be learned is that two medical stores are safer than one.

The cave hospital was improving day by day as it became more organized and as more equipment was brought in under cover of darkness; but the enemy was advancing and was not far away when orders came to move on 25 May. In the subsequent trek across the island, during which time a surgical team worked with the Field Ambulance, the need for improvising became even more insistent. Army tin hats are excellent as drinking cups, as wash hand basins, or as bed pans; if all strapping has been expended a 6-inch nail removed from a wall will make a good improvised extension for a fractured femur if driven through the sole of the boot. When elaborate treatment is impossible it is surprising how well patients get on if they have rest, food and drink and some simple wound treatment.

River Crossing in the Eastern Theater of War

[An article by Major Ludwig which appeared in *Militär-Wochenblatt* 15 May 1942. Translated from the German at the Command and General Staff School, Fort Leavenworth, Kansas.]

In the afternoon of 17 July, 1941, the first of the tank and rifle troops of the . . . tank division entered Krichev on the Sozh. The attempt to seize the big main bridge across the river by fast and bold action, before it was destroyed, did not succeed, this time. The bridge was blown up right in front of the tank of the officer of the 3d Tank-Engineers Company who was assigned the mission of seizing it.

The work of selecting a new site for a bridge which was now begun, was rendered difficult by heavy enemy artillery fire which was directed on the burning city. The river was found to have a width of from 150 to 160 meters and, as usual, had a high bank on the west and flat swampy lowlands about 3 kilometers across, on the east side. But in spite of the high banks on the west side, it was possible to see only as far as the edge of the forest on the other side. Examination with field glasses revealed the presence of two large water areas in the grass lands across the river, but these were traversed by bridges which apparently were still intact.

Since these bridges were of prime importance for the execution of the attack just as similar bridges 10 days before on the Dniepr, the divisional commander decided to cross the river south of Krichev the following night with a reinforced rifle regiment and seize the bridges by a surprise attack on the enemy. The 2d Tank-Engineers Company was placed under the orders of the regimental commander for carrying out this task. The engineer commander received orders to begin the construction of the bridge over

the Sozh as soon as the situation permitted.

Reconnaissance to the south of Krichev late in the afternoon revealed that there were only weak forces of the enemy, apparently on the opposite shore. In addition to this, there was a sluice there and a needle dam which had not been damaged. Riflemen would be able to pass in single file over the sluice gate and across the top of the dam.

In the bright moonlight we were able to cross the Sozh unobserved by the enemy by using the pathway across the sluice and dam and by pneumatic rafts. In the meantime the commander of the engineer troops had gathered all available bridge equipment in a woods about 4 kilometers to the west of Krichev. In the way of engineer forces for use in building the bridge, he had nothing but the 1st Company, as the 2d Company was engaged at S . . . R . . . in the operation for the seizure of the bridges and the 3d Company was assigned to the tank regiment to provide security for them. That did not leave him very many men. In addition, the company was much exhausted by the previous fighting and also was obliged to furnish local security for the bridge position.

About midnight, the preparations of the engineers were at an end. The battalion commander and the commander of the 1st Company were lying close to the edge of the water at the proposed location for the bridge. Notwithstanding the moonlight and the light caused by the fires burning in Krichev behind them, no details could be made out on the opposite bank. Nothing could be heard, either, in

MILITARY REVIEW

spite of the stillness of the night. Connections had been broken with the attacking rifle regiments. Had the shock troops of the 2d Company who had been sent to seize the bridges arrived at their destination? Was the far side of the river still occupied by the enemy? Would it be possible to start crossing the river now at the crossing place? But perhaps the enemy would learn of it and the operations against the bridges would fail as a result.

About 2:00 AM the engineer commander was suddenly stopped in his reflection by the sound of fighting along the edge of the distant woods which rapidly grew in violence. Mixed with the sound of the rifle and machine-gun fire the explosions of hand grenades and concen-

trated charges could be heard. He decided to cross to the opposite side with an assault troop and force the enemy out of the saw-mill which the Russians still occupied the evening before.

The operation was a success. The new mill was taken and the bridge position secured on the far side of the river. Immediately afterward, the work was begun on the construction of the bridge. In measuring the river which was now undertaken, it was discovered that the water had risen and that the width of the river was no longer 150 to 160 meters, as had been ascertained the day before, but 220 meters. This strange phenomenon certainly invalidated all calculations which had been made. The commander of the engineers knew nothing at this time of the dam a few kilometers to the south and whose sluice had been closed during the evening by the soldiers as they passed over it. The situation was taken care of, however, by the employment of all the means at hand.

Soon after daybreak, at about 4:00 AM a scouting detachment belonging to the 2d Company appeared and reported to the security detachment on guard at the bridge position, that the two bridges had been captured intact. In this operation the shock troops had arrived at one of the bridges at the same time as an enemy demolition detachment. At the other bridge, a non-commissioned officer and two men crept up and made quick work of

the double sentry by throwing the two men over the railing of the bridge into the water.

In spite of enemy artillery fire, their reduced numbers and the great amount of labor required in the preparation of the approaches, the bridge was ready at about 4:00 PM. About 150 prisoners were used in the work on the roadways. Again a fairly large river had been bridged, on the run, so to speak. The strong enemy attack which soon began showed what a mistake it would have been to attempt to stay there long.

The Building of the Bridge at Prudok

About noon of 2 August, 1941, the attack of the ... tank division along the Krichev-Roslavl highway, which up to

several construction battalions to provide any appreciable assistance here.

Late in the evening, the divisional commander gave the various subordinate commanders their orders for the following day. According to these orders they were to finish their preparations for the attack against Roslavl by 3:30 AM. So far the rifle regiment, which had been assigned to cooperate with the tank regiment, had succeeded in getting but a few motor vehicles across the Prudok area. The proposal made by the engineer commander to wait for the completion of the bridge, was rejected by the divisional commander. He ordered work on the bridge to cease and all available forces to help in the improvement of the detour in spite of the fact that the commander of the engineer troops expressed his doubts that the work could be finished in time with the men and means at hand.

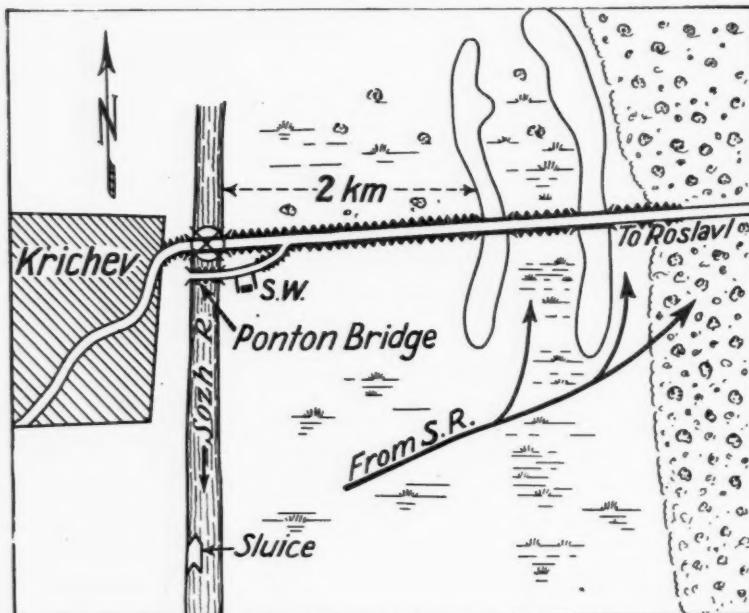
When, at 10:00 PM, he again returned to the bridge position, he was informed that the bridge material which was so much needed, had just arrived. He was faced with a difficult decision as to whether or not he should carry out the order to stop construction of the bridge and turn all efforts to the detour in view of the change in situation. He decided to hurry the work on the bridge as fast as possible.

A heavy rain which started shortly after this, turned the detour into a sea of mud. Now, at least, it would have been necessary to break the orders. The engineer commander withdrew the 1st Company from their task of helping with the traffic over the detour, as there was no chance of accomplishing anything more there. Unfortunately, the long rain and extreme darkness slowed down the work on the bridge, which in itself was extremely difficult. As if this were not enough, about midnight, time had to be taken for the exchange of fire with scattered Russian troops in the woods. It was necessary to assign portions of the 1st Company to take care of these guerrillas.

In spite of all these difficulties, however, the commander of the tank-engineer battalion was able at about 1:15 AM to report to the divisional headquarters the completion of the bridge. They were able to carry out the preparations for the attack on time. On the afternoon of 3 August, 1941, Roslavl was in the hands of the division.

Crossing of the Seym at Baturin on 8 September, 1941

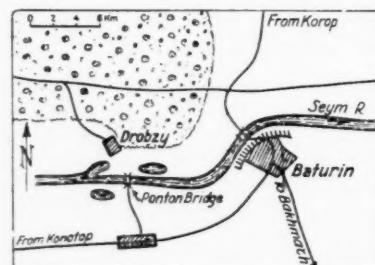
During the night and the early morning hours of 8 September, 1941, the ... tank division moved in three groups from



this point had been progressing well, was blocked in front of the Prudok sector which was stubbornly defended by the Russians. The bridge across the deep cut occupied by the stream had been burned; the slopes leading to the river were heavily mined. Artillery would have to be brought up to soften the enemy for further attack.

In the afternoon, a detour was finally found which could be used by the tanks in crossing the sector. The river was crossed with the help of the 3d Tank-Engineer Company. It was possible to envelop the enemy and drive him from his position on both sides of the highway. Immediately afterward, the 2d Company of the tank-engineer battalion, reinforced by a platoon of the 1st Company, was set to removing the mines from the highway and making preparations for the construction of the bridge. By evening, about 700 mines had been removed. The actual work on the bridge had to wait, as the heavy bridge material had not been able to follow so fast on account of the bad roads and the crossings of the Ostr river. The battalion commander estimated that it would arrive at about 9:00 PM.

In the meanwhile, the 1st Company of the battalion was put to direct traffic in its movements over the detour. They were not able to be of a great deal of help, however, because of the deep and steep rises. It might have required the help of



the east and northeast, against Baturin. The enemy had strong forces in the city and on the high shore of the opposite side of the river. He had blown up the bridge across the river a short time before the arrival of the advance elements of the rifle regiment which came in from the east. Artillery fire which was grow-

ing constantly more intense, was being laid down by the enemy along the edge of the woods to the northeast of Baturin.

The divisional commander, who was with the rifle regiment which was attacking from the east decided, in view of the strength and preparation of the enemy, not to cross the Seym at Baturin but at some other point to one side of the city. But still conditions were not favorable for this, on account of the bad roads and the broad marshy meadow land along the shore of the river. According to the map, the chance would be best in the vicinity of Drobzy.

In order to save time, the divisional commander and the commanders of the artillery and engineers proceeded immediately personally in their tanks to look over the situation in that area. They succeeded in reaching the river near this village without being seen, owing to the trees and shrubbery growing in those parts. The river itself was about 120 meters wide at this point. The opposite side appeared to be only weakly occupied if at all, by the enemy. But the roads leading to this locality looked very bad.

In spite of this disadvantage, the divisional commander decided to cross the river at this point in the afternoon and attack the enemy, employing a reinforced rifle regiment. While this was going on, the division artillery which possessed considerable fire power, was to lay down a barrage on Baturin and an attack was to be simulated with portions of another rifle regiment.

The first task of the engineer commander, was to assemble his battalion in the vicinity of Drobzy. This was not a very easy thing to do, as all the various companies were distributed among the attack groups and some of them were a considerable distance away. Here, as so often before, the radio proved itself to be the only possible medium for the transmission of the necessary orders. By its help, it was not only possible for the battalion commander to keep informed at all times of the location and situation of the various companies, but also to bring the battalion, including the bridge col-

umns together at the proper places before the beginning of the attack. Altogether during the day the three radio operators in his command car had to handle 243 radio messages either transmitted or received. The great number of messages handled was due, partly, to the previous engagement and partly to the fact that in the subsequent building of the bridge, the radio was used in calling the various trucks belonging to the bridge column, and in this instance it also handled the job perfectly. The experience of this particular day showed with a special force how necessary is a well organized radio network for handling a tank-engineer battalion with the rapidly changing situation which often obtains in the case of a tank division.

At about 5:00 o'clock in the afternoon, the preparation of the reinforced rifle regiment for the attack was completed. The construction of the bridge was simple and no difficulties were encountered. But the roadways leading to the bridge at both ends presented a serious problem. The main part of the battalion reinforced by a construction company had to be put to work on these. But in spite of the swampy nature of the terrain, by 5:30 PM of the following day, the roadways were at least in a usable condition and for the first time artillery was pulled across.

However, two more days, 9 and 10 September, of the hardest work were required by the whole battalion before the whole division was able to get across. Altogether 3 kilometers of heavy corduroy road were constructed here, requiring the cutting down of 25,000 trees.

But the engineers went to all these pains in the knowledge that effort in this place, would save blood. The enemy was completely surprised. The Russians were not fully aware of what was being done until the forenoon of 9 September, when they began to shell the bridge and the roads leading to it with their artillery. By this time, however, the river had already been crossed, and the movement of the German forces southward to begin the battle of Kiev, could not be stopped.

The Ground Defense of Aerodromes

[An article by Lieutenant Colonel V. C. Ritchie, R. A., which appeared in the *Journal of the Royal Artillery* (British) April 1942.]

The invader can only come to our island by sea or by air. Though indications of his intentions may be received some time in advance, it is unwise to count on more than a few hours warning of an actual sea-borne attack and a few minutes warning of an air-borne attack. Our object should be to prevent any live enemy setting foot on our soil, however he comes. Those that do, in fact, succeed in landing alive must be killed in the shortest possible time, preferably as soon as they touch ground.

Apart from the Royal Navy, which may not be able to intercept and destroy all the sea-borne attempts at once, and may take time to deliver its full attack, the best means of defense against the sea-borne attack is our Bomber Force. It can locate and break up the attempt before it reaches our shore. Beach troops, static troops, field force and guard will deal with those that do get ashore.

The best defense against the air-borne attack is our fighter force which can destroy the enemy in the air. In order that bombers and fighters may operate at will,

the defense of their airdromes becomes a matter of vital importance. The attack on them can take many forms.

(a) Bombing attack by enemy aircraft.

This was attempted during the Battle of Britain. It failed to achieve decisive success then and would assuredly fail again, now that our defenses by guns and aircraft are far stronger.

(b) Direct attack by parachutists and/or air-borne forces by day.

This is unlikely to meet with much success. The enemy troop-carrying aircraft would be intercepted by our fighters before they reached their objectives and a large number would be shot down. Such enemy as "bailed out," crash-landed or got down safely would be mopped up quickly by field force, static or home guard troops who are now adequately armed and thick upon the ground.

(c) Direct attack by parachutists and air-borne troops at or just after or before dawn.

Some parachutists would probably be dropped actually on the aerodrome and air-borne troops in gliders and power

driven aircraft would be landed on or close to the aerodromes. The interception and destruction of large numbers of these aircraft whilst still air-borne, would be difficult and a sufficient number would survive to put in a very formidable attack. Once even a few enemy get an effective lodgement in or near the aerodrome and can bring fire to bear on the landing ground, it is neutralized and the enemy has achieved his object for the time being. It is just this that simply cannot be permitted. There must be, therefore, a sufficient force actually on or in the immediate vicinity of each and every aerodrome, the defense of which is vital.

(1) To kill such parachutists or air-borne troops on the aerodrome itself.

(2) To counter-attack and destroy any enemy who come down in the neighborhood of the aerodrome before they can establish themselves.

Can such personnel be found from within the normal establishment of RAF or Fleet Air Arm personnel on the aerodrome?

In the writer's opinion they can be found for (1) above but not (2).

The RAF's AALMG's of the aerodrome defense, the arming of all officers and men of the RAF technical and administrative establishment and the provision of three or four armored cars (extemporized if need be) manned by RAF personnel should provide an adequate force for this purpose. Armored cars are essential to give the necessary mobility and fire power to the defense. This force would be under the executive command of the RAF Station Commander.

Constant practice "turn-outs" on the sounding of a special form of alarm to insure speed should make certain that any enemy who landed on the aerodrome itself were killed as soon as, if not before they touched down. Sound weapon training, enthusiasm and a high degree of alertness are all that it required. Preparation for the quick destruction of the landing surface by cratering must be made.

In the writer's opinion a special force is required for (2) above and it cannot be found from within the normal technical and administrative establishment. The size of the enemy force encountered is likely to be larger than in (1). It may well be heavily armed, it will have had a few minutes longer to organize, and it may soon be augmented by or it may even be comprised entirely from enemy forces who have landed in other areas or made their way inland from a partially successful landing from the sea. It must be met and destroyed without delay. A long operation and a hard fight may be necessary. Use of ground, co-operation with other arms and use of a variety of weapons (guns and mortars, etc.) may well be required. But one thing is certain. The enemy must not be permitted to overrun the aerodrome nor neutralize it. Even to consider a force detailed to recapture the aerodrome reveals a faulty outlook. It must just not be permitted to fall into enemy hands. It is far simpler to hold a place by forethought and preparation than to recapture it once lost and far less costly. The writer's suggestion is that a military force is required for the purpose. It has a normal soldier's job to perform. It needs the soldier's full armor and high mobility. But it must be stationed on or very near to the aerodrome it is to protect. Once it is clear, from the development of the general situation, that the force is no longer required there, it would be freed to go elsewhere. To put the boot on the other leg and have

MILITARY REVIEW

a force detailed to recapture aerodromes is to accept defeat. As has already happened in invasion exercises, when the need arises, for the force so detailed, to recapture the aerodrome, it will be found to have gone elsewhere to clear up a "mare's-nest" or to deal with an enemy force that does in fact exist.

The writer can see no gain in having the force required for (2) composed of RAF personnel. If a cat has kittens in a kipper basket they are still kittens! not kippers! If the men comprising the force wear battle dress, are trained and equipped as soldiers (and they must be) and do a soldier's task they will remain soldiers even if they wear an RAF cap. Moreover as they may have to co-operate with field force units they require to be dependent on the military system of supply and administration. They require the soldier's full armory and they must be led by officers fully trained in land warfare. Moreover, as soldiers, they are well fitted to be moved elsewhere in the battle once the situation permits. Be they soldiers or airmen the manpower position is not affected for, if they are necessary at all, they must come from the general manpower pool. The analogy of the Royal Marines is not strictly correct. The Army is responsible for the defense of naval bases, not the Royal Marines. Such of the Navy and Royal Marines as were present in a naval base when it was attacked would partake in its defense in the same way as is suggested for (1) above, but they are not responsible for the general land defense of the base. The Navy attempts to destroy the enemy at sea, the RAF in the air, but once the enemy is ashore from either element he becomes a military problem and a military responsibility.

If there is any intention that special aerodrome defense troops should form, also, the basis of glider, parachutists or air-borne troops, it is considered that training, supply when in the field, and equipping, will all be simplified if they remain a military body under the War Office.

Up to now, in this article, only aerodromes in the U. K. have been considered. It has been shown in Crete, Malaya and by our own action in Libya that aerodromes in theaters of war overseas may require special protection. Where we have control of both sea and air, and strong land forces are so disposed in contact with the enemy, that there are no open flanks, and aerodromes in rear are covered, the risk is not great. If the writer's suggestions are accepted and applied, in such cases, the military force could be withdrawn from the aerodromes and used in the land battle. Were it an RAF force complications would arise.

Conclusion

(a) By training and equipping with the necessary weapons the normal technical and administrative RAF establishment, the RAF should assume responsibility for the destruction of any enemy that land or are dropped on the land area of their own aerodromes. The Fleet Air Arm should assume the same responsibility for such enemy as land on the sea or shore within the perimeter of their own base.

(b) Outside the perimeter of the aerodrome the responsibility should be a military one.

It may be argued that to have this arbitrary line, the aerodrome perimeter, as a dividing line of responsibility is unsound. It is considered that the Navy's

Army's and RAF's mutual dislike of the enemy will overcome any tendency to show undue leniency to those of our foe who pitch near the dividing line.

Organization

If the above conclusion is accepted, it remains necessary to discuss a suitable organization for the special military forces disposed on or in the immediate vicinity of aerodromes for their defense. It is suggested that if they can be so organized as to be easily transferred to a role with the field force, once the need for them in their aerodrome defense role disappears, so much the better. I therefore suggest an organization called an "Assault Group" be formed on the following lines:—

Assault Group Headquarters.

One Bn. Infantry (motorized)—HQ and three coys.

One LAA Bty. (mobile)—HQ and three troops.

One A/T or Fd. Bty. (mobile)—HQ and three troops.

One Sqdn. Light Tanks—HQ and three troops.

One such group would be responsible for the defense of up to three aerodromes and their satellites, disposed on or in the immediate vicinity of each aerodrome, close liaison being maintained between the Assault Group Commander and RAF Commander concerned. For purposes of training and administration the forces would be under the HQ Assault Group. For operations each sub-group would be self-contained under its own commander who would be empowered to act on his own initiative if the necessity arose.

The advantages claimed for this organization are:—

(a) Sub groups could be readily concentrated for field training in land warfare under the group commander.

(b) The group as a whole or in parts could easily assume a role with the field force once the necessity for its location on aerodromes disappeared, the RAF commander's permission being a sine qua non.

(c) Supply of arms and equipment suited to land warfare would be simple and the normal military channels for the supply of petrol, oil and lubricants, ammunition, stores, rations and evacuation of casualties, etc., could be used.

(d) The RAF are relieved of their administration.

If the Force was of RAF personnel the same simplicity and elasticity could not be obtained and their diversion to the field force would present many difficulties.

The disadvantage of having good troops dispersed and locked up against a contingency that may never arise is appreciated. A careful study of the likelihood of attack on any particular aerodrome and the acceptance of the risk, where it is justified, will reduce the number of forces required. The loss to the enemy of an aerodrome may have a serious accumulative effect as a strong offensive force is then neutralized. The maximum protection possible must be provided if the threat exists.

Concentration implies superior force at the vital time at the required place. The vital place, under many circumstances, will be the aerodrome. The vital time, in the case of an air-borne landing, is the first few minutes when the enemy can be destroyed in detail as he arrives.

Concerning the Infantry Sapper

[An article by Major Nicolas which was translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the French article "A propos du pionnier d'infanterie" appearing in *Revue Militaire Suisse* June 1942.]

It is a mistake to confuse in one and the same person, the sapper and the assault unit combatant. It shows a grave misconception of the qualities required by a soldier belonging to the assault unit. I have no intention of offending the sapper and entertain no doubts with regard to his capabilities. But the assault troops require such intensive and thorough training over so long a time, that it would be foolhardy to expect the sappers to acquire this training in addition to their technical training and instruction.

The infantry itself, the fighting branch par excellence, has difficulty in acquiring this training,—at least with the present method of instruction. How would it be with sappers, whose essential concern is construction work and demolitions? The fighting value of our army would not be increased in the least by adding this extra training to the program of our technical troops.

Let each one work in his proper field: For the fighting branches, the infantry and light troops, let us provide the perfect fighting men required by modern methods of combat and let us leave the technical troops alone in their normal activities which they alone understand. The author supports himself by reference to the glorious traditions of the sappers: the sapper formerly fought in

the front ranks when fortified places were being stormed.

Comparisons are not always justifiable. Former combat situations bear no resemblance to the requirements of the modern battlefield. There did not exist the destructive fury of air bombardments. The maintenance of supply routes required to care for the needs of the battle, including command of the troops, will keep all our engineer units fully occupied. They will hardly be able to take care of their task in spite of reinforcements by special detachments of auxiliary services.

There will be no possibility at all of counting on them for combat service. They can not be in two places at once. If this were attempted, there would be great danger of their being in the wrong place at the decisive moment. Active service has already betrayed a numerical insufficiency of sappers. It is not possible to increase this number without at the same time decreasing the numbers of the fighting troops.

In former times the storming of fortified places was relatively rare and only a temporary matter. The majority of battles took place in the open country without the support of any fortified works. It was easy, therefore, to foresee the need for sappers in such localized and temporary employment.

FOREIGN MILITARY DIGESTS

At the present time, the soldier is constantly forced to attack these fortified positions such as field fortifications, bunkers and, above all, tanks, which are veritable moving fortresses.

This type of action has become the normal activity of the combatant. It can no longer be left to a few specialists. It calls for a general reshuffling of the front line organization. Combat of tanks, particularly, *require instantaneous reply on the part of whatever type of combatants are involved*. This action can hardly be anticipated, either in time or space. It would be erroneous to expect a small unit of engineers to handle this sort of action. A regimental company, for example, would never be able to handle so enormous a task. Such specialized personnel would almost always be missing at the critical time and place.

Those who argue in favor of the infantry sapper justify their theory by the importance which has been acquired in modern warfare by explosives. They consider that special troops are needed to handle them. This rather narrow opinion takes no account of the present evolution of tactics.

The first World War was conditioned by the automatic gun, which placed main emphasis on defense. The trench warfare which resulted from its employment, gave rise to the hand grenade. This is only an explosive whose employment has been simplified to the point where it can be handled by the infantry soldier. The effectiveness of this weapon corresponded perfectly to the ends for which it had been created. It was used against men who were exposed or only partially sheltered in trenches with no cover.

The construction of concrete dugouts and above all the advent of the tank, was destined to change the former conditions. The hand grenade became of no effect. Plans had to be made for the employment of much stronger explosive charges. Besides, the variety exhibited in the objectives, barbed wire obstructions, the gun ports of bunkers, tanks, etc., requires a great variety of explosives in form (long or concentrated), in quantity and strength, as well as in the manner in which they are ignited.

There was only one simple solution remaining: *to permit the regular troops to use explosives* and leave it to qualified technicians to create charges best adapted to the destruction of given objectives. Their employment does not require the learned calculations of the professional sapper for determining the exact quantity of explosives to employ and the location where it shall be placed in order to obtain the desired results.

Their employment, which is extremely simple, requires no long apprenticeship and necessitates the training of no specialized personnel. The combatant will not use them in engineer operations as for example the destruction of a bridge or a road. As a matter of fact, explosives constitute for him nothing more than very powerful grenades. They are meant much more for personnel than for materiel. They act almost as much, if not more, *by the wave of compression resulting from their explosion than by their destructive effects*. And when correctly placed, no bunker, no tank is sufficiently tight to protect the men in it from their effects.

The present World War is governed essentially by armored units which have restored supremacy to offensive action. This preponderance of offensive action in bringing about a new evolution in armies, analogous to that created by the

appearance of the machine gun in 1914. The struggle against the tank has become the supreme task, and the one on whose solution victory will depend.

Hence the combatant, above all, must be a "tank chasseur." *The antitank weapon must become the normal weapon of the infantry soldier*, in the same way that the machine gun pistol is at present. Therefore the army of 1918, equipped with automatic weapons, is being essentially transformed into an army equipped with antitank weapons. Among the latter, explosives, as well as the flame thrower, represents the weapon of close combat, the weapon which permits the unprotected soldier to face the armored giants. It gives him a last moment opportunity to conquer. (In the stories and pictures which come from Russia, we find many similar occurrences. We often see rifle troops, machine gun troops and artillerymen attacking tanks with explosive charges. This is proof that engineers no longer suffice). But if, in this

crisis, the combatant were without help of his own, he would call in vain for a few scattered specialists to come to his assistance. The inhuman machine would crush him without his being able to defend himself against it.

He can be helped only by a complete training of all combatants in the use of explosives in close fighting. What we need is not the creation of engineers,* it is a complete overhauling of the instruction and training methods employed with our fighting troops, particularly the infantry, in order that they may be adapted to the new conditions of war. Only this last solution could really reinforce the power of our army.

*This objection applies only to the conception of the engineer who should be at the same time an engineer and a soldier serving in an assault unit, and also the proposal of regimental engineers who should be the only specialists entrusted with explosives and flame throwers. On the other hand I see nothing wrong in decentralizing engineer units and assigning them to regiments. But they should be technical troops only and nothing else. They will have plenty of work.—Note by author.

Night Battle for a Populated Point

[An article by Captain K. Budrin, Russian Army. Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the article "Nochnoy Boy Za Naselyonnyi Punkt" in *Krasnaya Zvezda* 3 March 1942.]

A certain populated point was prepared by the enemy for stubborn defense. On its northern and northeastern outskirts the Germans constructed a complicated system of antitank obstacles, while light and heavy machine guns were installed in houses. It was also known that the Germans possess here a large number of antitank guns, several heavy guns and tanks. Numerically the enemy was four thousand strong. There were remnants of various infantry units defeated in previous engagements.

In order to suddenly surprise the enemy and thus to break his resistance sooner, it was decided to attack at night. Our unit received the order to capture the northern and northeastern outskirts of the place. A cavalry unit was engaged on our right; our left flank was open and, naturally, required special attention. The analysis of the situation convinced us that in view of the presence before us of the most heavily fortified sector of German defense a frontal attack is inadvisable. It was decided that a smaller unit would engage the enemy frontally while our main forces would strike at the flank.

Every battle requires careful preparation; more so a night battle. In addition to all of the commander's preparatory work, from reconnaissance to the inspection of equipment, we strive to have every man thoroughly familiar with his particular duty. To this end we inform each soldier of the mission of the platoon and company, giving him some information about the enemy and pointing out to him, without fail, on the terrain, the disposition of enemy firing points. It is also most important to point out to each man the place of assembly after the battle. During night combat for a populated point action is conducted by small groups of soldiers and frequently the men act individually. While penetrating into the rear of enemy defensive position and destroying the Germans on streets and in houses, our men may lose contact with their unit. Yet, when the assembly point is known the personnel concentrates there at the conclusion of the attack.

Such a detail as the setting up of a definite password also may not be forgotten. During the winter night, when both sides may be dressed in white smocks, it is difficult to distinguish friend from enemy when a man is walking or moving towards one. In such cases a password enables one to quickly distinguish friend from enemy.

All of this preparatory work was accomplished by us. In addition it was necessary to assure cooperation with the cavalry unit, which also was done. Common signals were determined such, for instance, as signals to indicate the appearance of enemy tanks, one for attack, etc.

At three AM our unit started from the jump-off position. The night was cold and frosty, a sharp, stinging wind was blowing. Deep drifts made movement off the roads difficult. A group of soldiers under Sergeant Shapovalenko was unceasingly reconnoitering the enemy front line of resistance. After a while fire was heard. It came from Lieutenant Fomichev's unit which took up a position on the highway before the enemy front and engaged the Germans. Taking advantage of the fact that the enemy's attention was diverted elsewhere our main forces, in accordance with the order, executed a flanking movement on the left and unknown to the enemy emerged on the line of the attack.

A group of automatic riflemen was ordered to penetrate into the vicinity of enemy antitank guns and kill their personnel. This action was protected by tanks with which we were reinforced. These men were crawling towards the enemy with their automatic rifles and hand grenades. Their action was fearless and tricky. Private Katraga destroyed the personnel of three enemy antitank guns and killed several automatic riflemen. Altogether ten guns were put out of action.

As soon as the enemy antitank artillery was sharply weakened, our tanks and infantry attacked. The enemy, emplaced in peasant huts on the outer edge of the place, was offering stubborn resistance.

MILITARY REVIEW

Automatic riflemen and machine gunners had to be dealt with in every house. Hand-to-hand fighting broke out.

Within about two hours the enemy was thrown out of the place and we reached its southwestern edge. The streets were strewn with many enemy bodies. In running away the enemy abandoned, on our sector alone, 24 guns, 3 tanks, 10 antitank rifles and 2,000 rifles.

The defeated Germans ran to the south, but without success. During the night, at the beginning of the battle, Lieutenant Berdnikov's unit was transported atop tanks to a point about 3 miles behind the enemy position in order to cut off retreat. Upon reaching destination this unit immediately took up a defensive position and in the morning the running Germans suddenly encountered heavy fire and, fearing encirclement, veered aside from their designated route.

All inclusive advance preparation together with suddenness of the blow assured the success of this nocturnal engagement. Generally speaking the experience of night fighting suggests certain methods which, in our opinion, are materially important.

For instance, it is believed that the use of signal flares during the night attack is inadvisable, inasmuch as this uncovers the troops. Flares may be used only to signal the attack, when the enemy is already powerless to do anything. Otherwise most convenient are electric flashlights with glass of various colors. At times nights are so dark that it is absolutely impossible to observe enemy action during the progress of fighting. In such a case fire should be set to a building in the center of the village, or on its outskirts leading towards the enemy rear. All enemy movements will then be clearly visible against the reflection of the flames. This we have tested in two night engagements.

In the winter and especially during the winter night the enemy huddles close to populated points. The intervals between them are frequently controlled only by patrols. More than once this enabled our reconnaissance to penetrate with impunity into the enemy rear, to by-pass a German-occupied village, to observe all roads and at times, also to break into the populated point. Frequently, during cold nights, we send patrols to the populated points, who there dig themselves into the snow and proceed to report by telephone

everything they observe. Once such a patrol reported the movement of an enemy reconnaissance party of eight. After we took the necessary measures four of these were killed, and others captured.

Frequently during night combat infantry acts jointly with tanks added for its reinforcement. It is difficult at night to observe the enemy from the tank. In order to help the tank crews we employ the following method. One or two infantrymen climb atop the tank. As soon as the tank stops they get off, assume the prone position and proceed to observe. Upon discovering enemy firing points they point them out to the tank crews.

When organizing a night engagement it is necessary to take into account that enemy preparations for night defense are very thorough. Frequently, very heavy enemy fire is conducted against previously registered terrain features. Fearing the penetration of our units the Germans almost unceasingly fire flares. In some instances they purposely permit our units to come up to a distance of several scores of yards from their front line, and then open fire from their concealed positions.

The least inaccuracy and lack of thorough preparation adversely influence the progress of battle. Once we were to capture a village. According to information received earlier the enemy occupying it was not very strong. Supplementary reconnaissance should have been made, but this was not done and during the battle it became evident to us that the enemy outnumbers us several times. In spite of having very strong infantry the Germans also brought up a mortar battery, three tanks and three heavy guns. The village outskirts were found to be mined, embrasures were built in the houses which were connected by communication trenches.

As soon as one of our platoons broke into the village loud blows against a rail were heard. Immediately the Germans opened up an intensive fire, committed all their forces in the battle and we found ourselves in an unfavorable situation. True, during this battle our men inflicted on the enemy heavy losses, killing about three hundred of his men, but we failed to capture the village.

Our unit has conducted fifteen night engagements and experience has shown us how important is the careful organization of such combat.

troop combat service will suffer as a result of the shortness of the time available for it. The more completely this regulation training is mastered, the better fitted the troop is for executing the tasks which will be assigned to it.

The combat service of the construction troop is intimately and mutually related to their technical activities in time of war. This must be taken into account both in the training of men and in assigning particular tasks to them. The assignments must be formulated concisely and, as nearly as possible, should be like those encountered in actual warfare. Further, the terrain should be carefully chosen for the particular end in view. All technical tasks, where interference by the enemy is possible, should be made real to the troop by hostile opposition. Some of these various types of interference may be attacks by enemy tanks, cavalry, motorcycle and bicycle troops, scouting detachments on foot, gas, and attacks by the enemy aviation.

In the following paragraphs, some of the training lessons of construction troops will be briefly discussed. They reveal the number and diversity of the requirements, ordinarily, proper to the infantry, but which must be met by construction troops in addition to those which are proper to their particular branch of the service.

Marches and March Security

Construction troops are often required to labor at heavy construction work after hard marches. In order to accustom them to hard marches they must be systematically trained from the beginning. They must learn the requirements relative to march discipline, contained in Army Regulations 130/2-a, Addendum II. After finishing a task, they are often required to catch up with the troops who have gone on ahead, travelling at times after dark. They will have to secure themselves on these marches, therefore (Army Regulations 130/2-a, Article 506, etc.) since they may meet at any time with groups of the enemy operating back of the front. They must also provide for protection against attacks by enemy aviation during marches, by means of light machine guns, or troops with rifles (Army Regulations 130/2-a, Article 506) Special air guards may also be required. Proper provisions should be made for warning the troops in case of the appearance of hostile planes. In case of air attack, the troops should conduct themselves in accordance with Army Regulations 130/9-a, Addendum II, Article 653-657. The troops should be trained in the use of rapidly constructed barricades. They should also be trained in night marching (Army Regulations 130/2-a Article 163, etc.) They should learn to use the compass (Printed Army Regulations 362).

Security of the Place of Operations and Shelters

The relationship between combat service and their own proper employment is most apparent when combat troops are called on to guard the place where construction operations are in progress. There must be security against both air and ground attacks in all construction work such as bridge building, highway or road work, etc. The best security with the use of skis, in the winter, is provided by means of reconnaissance detachments (Army Regulations 130/2-a, Articles 177 and 334, etc.)

Security detachments sent out in the direction of the enemy (sometimes also groups sent out from the flanks and to the rear), must be far enough removed

Hints and Suggestions for the Combat Employment of Army Construction Troops

[An article by Lieutenant General Klingbeil in *Militär-Wochenschrift* 4 June 1942. Translated from German at the Command and General Staff School, Fort Leavenworth, Kansas.]

The severity and peculiar nature of combat in the eastern theater of operations have necessitated at times, the employment in combat tasks in the front lines, of army construction troops whose duties ordinarily consist in the execution of technical tasks, the removal of obstructions, the building of roads and bridges, field fortifications and camps. Aside from the not infrequent occasions when circumstances made their employment in place of infantry necessary in the foremost zone of the defense front, they were also engaged back of the front against detached enemy troops, against air-infantry, against organized groups of guerrillas, etc.

The combat training of construction troops must be suited to tasks anticipated in any particular campaign. The points which must be emphasized, therefore, are:

1. The security of troops on the march.
2. The security of the localities where they themselves are engaged, and security of the shelters occupied by them.
3. Defense and attack of limited objectives.

Their combat training ends with the group and the platoon. If this training is extended so as to include the combat problems of the company, the thoroughness of their training in construction

FOREIGN MILITARY DIGESTS

from the place where the construction is being done, to be able to operate effectively against smaller groups of the enemy. Every enemy patrol which chances along must not be able to put the construction place under fire. The detachments must also know exactly what they are to do in the case of an attack by the enemy. There must be liaison and cooperation between all the groups, including those in the rear.

The troops which are engaged in work must always have their weapons ready at hand. They must be clearly informed in advance what to do in case of attack. Detailed information regarding defense against air attacks is found in Army Regulations 395/1, 395/2-a and 130/9; regarding tank attacks in Army Regulations 130/2-a, Articles 324-327 and 414-419, also 130/9. They must be mastered by the troops.

Experience has further shown the importance of the security of shelters, even when these are situated far to the rear. The possibility of attacks by guerrilla formations must never be forgotten. Therefore, thorough instructions in security is indispensable (Army Regulations 130/2-a, Articles 348-357).

Defense

In case of an attack on the outer line of resistance, the task of the security detachments becomes intensified, and automatically is changed to defense.

The groups must be trained in rapid preparation for defense in case of attack (Army Regulations 130/2-a, Article 311 etc.) so that they will be able to block with their fire in front whatever sector they happen to be in and also be able to furnish flank protection to the sector adjoining them on the left. As a rule the machine gun is placed in the center of the group, and the rifle troops in nests, each with 2 to 3 men, on both sides. Matters must always be arranged to permit the influence of the group leader to be felt by the entire group. One fundamental rule to be observed is the following: the possibility of effectiveness of action must come after the matter of the effectiveness of the "3" protection enjoyed. Alternate positions must be decided on. Rifle pits must be constructed (Army Regulations 316, Illustration 317). Attention should be given to the nature of the soil where the positions are established; also the nature of the background. The amount of illumination falling on the position and possible need for camouflage, etc., should be considered. Conspicuous points on the terrain and the edges of forests should be avoided. Dummy positions should be established at such points. Use should be made of the doors and windows of houses. There should be no firing from the doorways or windows themselves, but through them from the interior of the house. The correct deportment in case of attacks by hostile aviation or tanks must be learned, also the correct preparations for defense combat by a group after night-fall.

The group should always receive a well-defined combat assignment.

In the case of larger formations (a platoon for instance), keep forces ready for use on the flanks and in the rear.

Attacks With Limited Objective

If security detachments are forced to fall back under the attack of superior forces, or if the line of defense is penetrated at some point and the construction forces are in danger from the enemy with consequent delay of operations, the commander of the unit will make the decision to attack with limited objective

(Army Regulations No. 300 for Troop Commanders, Articles 320-334 and 637) and with the forces available to him against the wings, flanks or rear of the enemy, or weak places on his front. Also there will be quick change-over from work to combat, the rapid organization of combat formations with clear and well-defined combat tasks. Generally speaking, attacks with limited objectives will accomplish no more than moderate results.

In the case we are considering, it is expected only to restrain and block the enemy temporarily. The attack objective may be easy and may be attained by the employment of weak forces; again it may be difficult, and require the engagement of all the forces available. When the objective is close and it is not anticipated that the attack will be difficult, the matter of depth may often be neglected, as regards the attacking formations. When facing a bitterly fighting foe, there may be hand to hand fighting (Army Regulations 130/2-a, Addendum I) which, including the throwing of hand grenades, must be mastered by the construction troops. Once the attack has been launched, it requires careful study of the situation to know whether to stop it at a given time, or continue on after the enemy. In fighting guerrilla formations in wooded country, it may be necessary to comb the woods for remnants of the enemy before halting the attack.

As a rule, and in order to take advantage of any propitious situations that may arise, subordinate commanders must be allowed certain freedom in the conduct of the attack. They should be particularly trained in the matter of making independent decisions and in adapting themselves to changing situations. Examples:

1. Counter attack of a group against the enemy who has broken into the positions as an example of an independent decision of a group commander. The enemy is first forced to the ground by fire, then hurled back or destroyed in the attack.

2. Harassing of the passing enemy by fire, feint attacks, attacks directed against his rear lines of communications, night attacks.

Hostile strong points are not to be attacked from the front, but from both sides, at once. They must be held down by fire from the front, then attacked by shock groups either in the flanks or in the rear, making use of the cover afforded by ravines, hollows, woods, etc. The attack should be synchronized to coincide with the attacks of the detachments coming in from the side, which have a greater distance to cover. There must be accurate cooperation between the units affording fire protection and the assault troops either by means of watches (the operation having been timed previously) or flash signals.

During the winter months in the eastern theater of operations, construction troops have often been used in the hard defense fighting in the front lines. On account of their armament which consists merely of rifles and light machine guns, they have been reinforced in these cases with heavy infantry weapons and provided with signal equipment. This makes it necessary that commanders of construction troops be trained in the operation of the heavy infantry weapons and in the methods of combat of the reinforced infantry battalion. They must also possess ability in the matter of decisions and command.

Interior versus Exterior Lines

[An article by "Basilisk" in the *Fighting Forces* (British) April 1942.]

Jomini coined the term "Interior Lines," and Napoleon adopted it as an expression of his own strategy—"As for me, I am always on interior lines," he once declared.

Let us start by defining the term. Since Jomini invented it his definition should suffice; but unfortunately Jomini, in spite of his acute brain, could not express himself clearly on paper. Moreover, he makes nonsense of his own definition by declaring twice in his "Precis of the Art of Arts" that Wellington and Blucher defeated Napoleon by the use of interior lines, whereas, of course, the direct opposite was the case. Since his day, every writer on strategy has produced his own definition, so I will produce mine. I would put it in this way. "The force operating on interior lines is more concentrated than its opponent, and tends to have convergent lines of communication, whereas the force operating on exterior lines tends to have divergent lines of communication." The simplest form of interior lines, which may be called the Static form, is shown in Fig. A in the accompanying diagram (the dotted lines indicate the lines of communication). Such a situation is generally imposed upon the interior force. Previous examples are: Macmahon at Se-
dan, and Hood at Atlanta. For the former it was fatal, but the latter ex-
tracted the maximum of advantage that interior lines offer by striking thrice

with lightning speed at his famous opponent, Sherman. Only faults in execution prevented a dazzling victory.

The second, and most typical, form of interior lines is that where two or more converging forces oppose a single force (Fig. B). A classic example is Waterloo. This is the form that is most favored by strategists, for if each opponent can be concentrated upon and struck in turn he will presumably fall back along his own lines of communication, thus diverging from his companion force. A classic example of this is generally given as the opening of Napoleon's Italian campaign (as to this, we shall have something to say presently).

But there is a third, though not generally recognized, form of interior lines; that is, where two opposing forces meet head on, on parallel lines, and one of them deliberately creates a state of interior lines by penetrating between the two columns of its opponent (Fig. C). A classic example is Napoleon's 1814 campaign.

Now the fact that Napoleon is associated with the strategy of interior lines has induced students of war to attribute his success primarily to the use of them; yet if we review the results he attained from their application we shall find that they never gave him decisive results. Nor should this discovery surprise us, for a reason which shall be indicated later.

MILITARY REVIEW

The following are the chief campaigns in which Napoleon's success is usually attributed to the adoption of interior lines:

1. The Italian Campaign, especially the opening of it at Montenotte. In this campaign the youthful Bonaparte thrust himself between the Austrian and Piedmontese armies, whose lines of communication ran respectively northeast and northwest. The commonly accepted version of the story is that Bonaparte attacked first the Austrians, who consequently fell back to the northeast, and then turned on the Piedmontese, who retreated northwest, and, thus isolated, sued for peace. The actual fact is that the Austrians did not retreat northeast but northwest, towards their allies, and when the latter gave up, the former were within two days' march of them. (For proof of this statement, see "The Gamble," by Professor Ferrero). Moreover, Professor Ferrero shows, conclusively to my mind, that the Piedmontese army was not defeated in the field, but that the King was bluffed into making terms. It is also a fact that Bonaparte did not attack the Austrians at Montenotte, but was attacked by them in flank while he was marching against Ceva (in Piedmontese hands), at the behest of the Directory. In short, the successful outcome of this campaign can hardly be attributed to the deliberate use by Napoleon of interior lines.

Bonaparte's successes in the region of Mantua, though brilliant in themselves, did not directly lead to decisive results, though his spectacular march towards Vienna might appear as a decisive move. The fact is that at Leoben, Bonaparte was bluffing again, and in any case Austria treated on fairly level terms. So far from exploiting interior lines in this advance, Bonaparte was handicapped and disturbed by them. He admitted as much in a letter to the Directory, in which he explains that the Vienna army "would have fallen back before us, would have joined up with one part of their Rhine army and would have overwhelmed me." This is very likely; the French army might have been crushed between the two Austrian armies operating on exterior lines.

2. The Ulm Campaign.—Most people would regard this rather as an operation on exterior lines against the Austrians at Ulm than an interior-lines operation, but the school that persists in seeing nothing but interior lines in Napoleon's operations claims that he deliberately interposed his army between the Austrian and Russian armies, as he is supposed to have done in the Montenotte campaign. For this I can see but flimsy evidence.

3. The Leipsic Campaign.—This certainly fits the bill, but it is not particularly flattering to the exponent of interior lines, for their adoption was the Emperor's undoing. That profound thinker Colonel A. Grouard made a close analysis of the campaign many years ago. The book was never translated into English, and I have lost it and cannot recall its name. I append, however, the notes that I made at the time, giving the conditions postulated by him, from a study of this campaign, for the successful use of interior lines:

1. Never attack in several places at once.

2. Always attack somewhere.

3. Continue an attack until the enemy has been completely repulsed and driven back.

4. If driven inwards at all points concentrate and break out of the circle.

It may be noted in passing that Rommel appears to have paid some regard to these maxims in the opening stages of our November offensive.

4. Campaign of 1814.—In this campaign Napoleon won some striking successes on interior lines, but his opponents had by this time discovered the way to counter his strategy—and the campaign ended at Fontainebleau!

5. Waterloo.—Again exterior lines (page General Jomini) decisively defeated interior lines.

This brief summary shows that even when in the hands of a master of war interior lines do not often produce decisive results.

The same thing is true of succeeding wars. Again a brief summary may be useful. For half a century after Waterloo the power and magic of Napoleon's name kept the strategy of exterior lines under a cloud. But eventually a soldier arose, big enough and perspicacious enough to dispute the current doctrine. Moltke realized that, whatever might have suited Napoleon, conditions had changed, and that improved means of communication now favored the strategy of exterior lines. No wonder Napoleon disliked them! They demanded not only better communications than obtained in his day, but the delegation of power and initiative to his subordinates—a course that he hated. The general operating on exterior lines can have little influence on the battle once it is joined. Instead of one central reserve he must divide it up and hand it over to his subordinates. But they cannot be expected to act with decision and drive if they are in the dark as to the whereabouts and doings of their neighbors. Thus their action tends to become paralyzed. A classic example of this is the escape southwards from Winchester of Stonewall Jackson in his Valley Campaign. By rights, he should have been cut off at Strassburg, but neither of his two opponents to east and west of him dared to stir, not knowing the situation of the other.

Not so was it with Rommel when he attacked our bottle-neck southeast of Tobruk from two sides simultaneously. Here he could exploit the advantage of exterior lines, for he was able by wireless to keep both separated forces in touch with one another.

To return to Moltke: He is commonly regarded as the exponent of exterior lines. In the war against Denmark he designed a two-fold envelopment of the Danish forces. In 1866 he used exterior lines to defeat the Austrians decisively. As his two armies were approaching the enemy he deliberately kept them a day's march apart. And he reaped his reward. In 1870 his use of exterior lines was not so obvious, but Sedan is a shining example of their decisive effect.

Previous to this, Grant had stumbled upon the same solution in the final year of the American Civil War. The theater was immense, but the Federals were inescapably on exterior lines, and the keynote of Grant's strategy was that he enjoined all his armies to attack all the time. To this the Confederates had simply no reply. Once this policy was adopted the result was a foregone conclusion.

Coming to the wars of the present century, Lord Roberts conducted the Boer War on exterior lines. Converging armies advanced on Pretoria, the hostile

capital, from southeast, south and southwest. Against such a concentration of force the Boers were powerless, and with the fall of Pretoria the back of their resistance was broken.

In the Russo-Japanese War the Japanese made full use of exterior lines, three armies converging on Liao-Yang, where a decisive battle was fought.

In the Great War the Allies were situated on exterior lines and ultimate and decisive victory emerged when all our armies attacked all the time.

Finally we come to the present war. In Poland, Germany made full use of exterior lines, the power of her thrust south from East Prussia being a matter of general surprise. And, of course, when Russia completed the circle of lines there was no hope left for Poland. The Dunkirk campaign, viewed broadly, was one of the rare examples of a decisive campaign conducted on interior lines. The Germans penetrated our lines at Sedan, and then fanned outwards. The decisiveness of its result is due to the fact that our line of retreat was cut off by the sea. Under such conditions interior lines can give great results. It may also be observed that, regarded tactically, the German panzer divisions were operating on exterior lines. The B. E. F. was attacked ultimately from three sides. In this campaign communications between the Allied forces on exterior lines broke down, and good communications are, as we have seen, a primary condition of success.

In the final campaign, or "Battle of Paris," the Germans were again on exterior lines, their armies in the east breaking through the Maginot Line in at least two places.

In Greece neither side held exterior lines, but the fact that the sea was at our back governed the decisiveness of the result. Syria and Abyssinia are clear examples of the success of exterior lines. Last of all, the Malayan campaign exhibited the same features. The Japanese drove down on Johore in three columns, from the north, northeast and northwest. Though we had the space, we presumably had not the time to attack them while they were separated, and the result was decisive.

What do we learn from all these examples? Surely that, even in Napoleonic days, and still more in modern times, a campaign fought purely on interior lines, though giving scope for brilliant feats of strategy, never leads to decisive results unless the enemy's retreat is cut off by the sea or some other impassable obstacle.

If we consider the conditions and disadvantages under which interior lines operate, the above rather unexpected conclusion need occasion no surprise. For the situation is like that of a boxer pitted against two or more opponents in a ropeless ring. You may drive one opponent into the corner—and that opponent can jump out of the ring, only to return to it when you have turned your attention to another opponent. This may go on indefinitely, and your prospects of a decisive result are small. If, on the other hand, the ring is roped (represented in strategy by the sea or other impassable obstacle), the prospects of a decision are considerably enhanced.

But other conditions for success are required. The ring must be so large that your opponents cannot strike you simultaneously. You must keep them sep-

erated. Further, you must deal with your immediate opponent so drastically that he will not be able to make such a quick recovery that he can strike you in the back while you are tackling Number Two. Whence it follows that the quicker you can swing round on to Number Two the greater chances you will have of accounting for him before help can arrive.

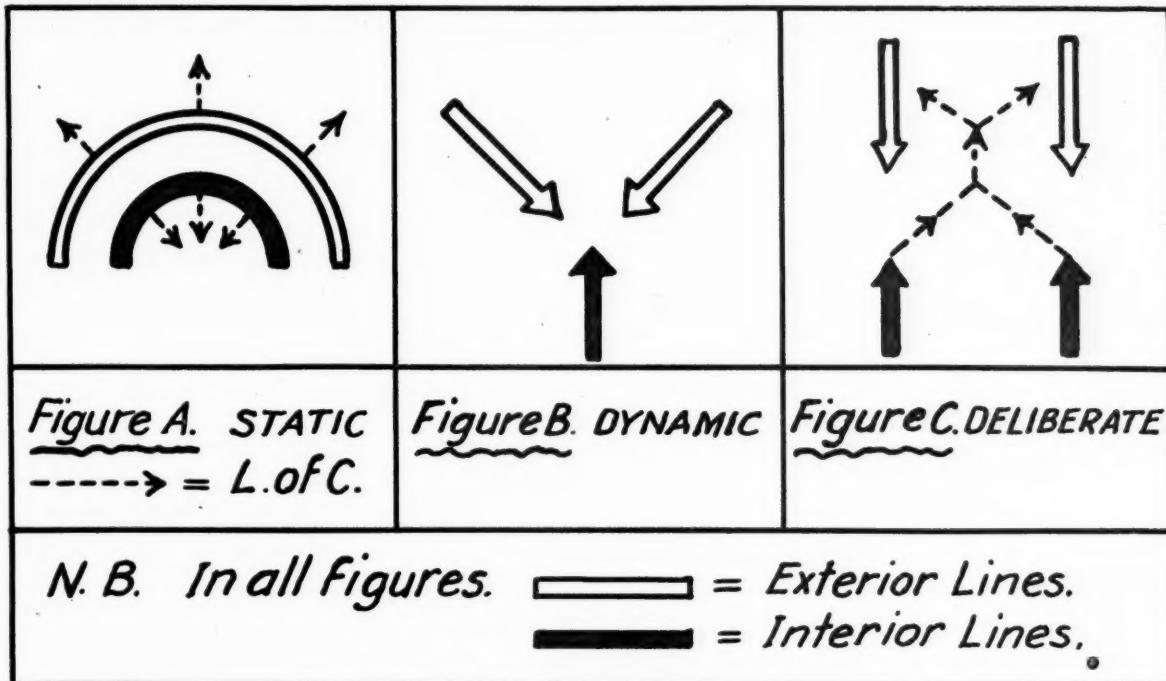
Applying these considerations to strategy we can say that for the successful operation of interior lines you require time and space to manoeuvre. If either of these is too small you are likely to be overborne by the combined and co-ordinated columns of your opponents

along the line. In this case you will probably not be able to afford to ignore one of his columns temporarily while concentrating against another. The boot is now on the other leg. As long as the enemy continues to advance and attack, the advantage inclines to him, and once he has advanced so far that you no longer have time and space to manoeuvre, the advantage is entirely on the side of exterior lines.

We are now in a position to tabulate the conditions favorable to the employment of interior lines. They will not be far different from those deduced by

our Allies) can join in a combined offensive with Russia, Germany holds the strategic advantage—as she did in the Great War until the Allies were able to attack at all points and all the time. When that happened Germany's fate was sealed. In virtue of her interior lines she can switch her striking force (and especially her air force) many times more rapidly from flank to flank than the Allies can. The only possible remedy for this unfavorable state of affairs is a combined offensive, which will keep her hands full in all theaters.

But this is a world war, and the strategical position is not quite covered



(speed is an obvious factor in obtaining this time and space). At the same time, if you attack while the space is unnecessarily large, or if you make it too large by pursuing one opponent too far, you may not have time to get back to the succour of the covering troops that you must have left watching enemy Number Two. Very nice and delicate judgment is evidently required. That is the chief problem that you have to contend with. On the other hand, your task is in some way easier than that of your opponents, for communication, coordination and control ("the three Cs") are easier, as also the intelligent and timely employment of the general reserve to deliver the knockout blow. Moreover, if your enemy elects to remain permanently on the defensive you have it in your power to neutralize his superiority in numbers (if he possesses it) by the rapidity with which you switch your attacking forces from one spot on the perimeter to another. It is obvious that it has a shorter distance to move than the hostile columns. It is indeed quite likely that they will not attempt the movement at all, for you by initiating the movement have the lead in time as well as in distance.

Naturally, if the enemy takes the offensive your difficulties are considerably increased, especially if he advances all

Colonel Grouard, based on his study of Leipsic campaign:

1. There must be sufficient time and space to manoeuvre (but too much space will defeat your object).
2. You must keep the hostile columns separated.
3. Only attack one of these columns at a time, concentrating superior forces against it.
4. Continue this attack until he has been definitely defeated and driven back.
5. (If the enemy is advancing) Always attack somewhere. Corollary. Decisive results can only be expected if the enemy's lines of retreat are blocked.

The converse considerations apply, generally speaking, to the adoption of exterior lines, which postulate:

1. Superior numbers, for a greater front has to be held actively.
2. Good communications between the various columns.
3. An attack at all points, all the time.
4. Resolute and bold subordinate commanders of columns.

And, finally, let us apply the foregoing considerations to the present war, and see how they favor us or the Axis.

The first factor that leaps to the eye is that Germany is on interior lines as opposed to the United Kingdom and Russia. Therefore, until we (and, of course,

by the above statement. If we leave Great Britain out of the picture for the moment, and consider Germany's eastward push for oil, the positions are reversed. Her strategic reserve in the Middle East (properly so called) is then seen to be on interior lines. If Germany advances southeast from the Black Sea and east along the north coast of Africa our forces in Palestine can act on interior lines and, if they assume the offensive, can concentrate their reserves against one or other of their opponents more speedily than Germany can adopt counter-measures. Her remedy would, of course, be to attack simultaneously in both regions—a course that we must expect and be prepared for.

We now come to Japan. She, of course, is acting on interior lines, whether we consider only Asiatic regions or include American.* Moreover, she possesses two of the desired conditions for interior lines: firstly, speed (this is implicit in my first two conditions), for her maneuvering ground is the sea; secondly, her opponents have their line of retreat blocked (in all cases, except China—where, be it noted, no decisive result has been achieved)—by the sea. Quite apart, therefore, from the chances and changes

*Of course, if she could penetrate as far as the Persian Gulf she and Germany would be able to operate on exterior lines against our Middle East Force.

MILITARY REVIEW

of warfare—Pearl Harbor, Prince of Wales, etc.—interior lines give Japan the pronounced advantage, and it is not in the least surprising that she has managed to achieve decisive results by its means.

But let us take comfort. Germany, not Japan, is our vital enemy. Germany is

and must remain situated on interior lines. She does not possess the predisposing strategic conditions for decisive success, whereas the Allies look forward to the time when their possession of exterior lines, combined with superiority of numbers, good coordination and resolute leaders, shall "command the victory."

while they are engaged in combat with the "ME-109."

The third group of German fighters is represented by "ME-110." These are employed by the Germans for deeper accompaniment of bombers or for independent attacks on our airdromes. In the latter event they usually act individually at night.

In their attempts to change from the method of direct accompaniment of bombers to the tactics of crowding out our fighters from the battlefield, the Germans are trying to establish a certain air superiority at the outset of an aerial operation. In the air battles which we have observed the Germans have, as a rule, committed considerable numbers of fighters in groups of 8 to 12 and sometimes as high as 20 aircraft. Acting at various altitudes on a narrow sector of the front they made attempts to crowd out our fighters and thus clear the way for their bombers.

Similar German shock groups may be able to attain success if they are not opposed by units and groups of fighter aircraft supported by reserve formations of fighters taking off the ground at the right moment. Where these measures are applied with sufficient initiative and inventiveness the German shock formations fail. On some days on a 20-25 kilometers wide sectors of the front, no less than 25-25 aerial combats were observed daily. As soon as our air units engaged here understood the method of mass employment of enemy fighters, our fighter forces were immediately increased. Their strength in planes was increased three and four-fold. As the result the enemy was forced to reduce the extent of activity of his fighter aircraft, changing over again to the method of accompaniment of bombers.

The Germans achieve their great concentrations of aircraft, above all, through their handling of airdromes. Thus, on one of the sectors of the front, where the availability of flying fields is very low, they succeed inside of a few days in concentrating quite a considerable number of aircraft.

German attempts to attain secret concentrations of aircraft on the decisive sectors of the front were more than once registered by our aerial reconnaissance. In this the Germans employ all kinds of ruses and tricks. Sometimes it is a preliminary raid on a target followed by a landing at the new bases at dawn or nightfall. It is in this manner that at the beginning of their offensive operations the enemy transferred to Crimea several groups of bombers and fighters from the southwestern front. A captured prisoner, master sergeant—pilot Friederich Jacobs, testified that his squadron was to fly to another destination after the completion of the Crimean operations.

In stressing the German attempts to mass the actions of their aviation over the battlefield, it is necessary to give special consideration to certain tactical methods of the enemy, different in principle from those observed in the past. For instance—as this was noted on one of the sectors of the front—the enemy began quite frequently to abandon the method of direct accompaniment of bombers by fighters, employing instead, a new tactical method.

The German "Messerschmitts" are now basically divided into three groups. The first group consists largely of "ME-109's" which are frequently employed for attack action. To this end the Germans have installed bombing equipment on the "ME-109," capable of carrying a bomb load of 200-250 kilograms.

Three pursuit-fighters are intended above all, for employment against our troops by dive bombing and strafing. Each of such attacking units consists of 9 to 15 aircraft.

The second group of fighter aircraft consists of modernized pursuit ships of the "ME-109F" type. As experience shows, this group attempts to engage our air patrols before the arrival of enemy bombers. The following method of cooperation between the "ME-109" and "ME-109F" should be noted. The former usually fly at lower altitudes and attempt to engage our aircraft. While at the same time the "ME-109F's" fly to higher altitudes and, selecting a favorable moment, they execute diving attacks at our aircraft. They do not engage in the battle as such, but again attempt to gain altitude and repeat their attack. Therefore, our fighters should at all times bear in mind the possibility of unexpected attacks from above by "ME-109's,"

This spring the tactics of German fighters differ from last year in certain interesting details. For instance, the enemy started the frequent practice, along with the massed employment of fighter aircraft and augmenting air strength during the course of combat, the so-called free raid by pairs of individual aircraft. Their mission consists mainly of seeking out individual planes at a distance of 50 to 60 kilometers from the front line.

Not long ago our fighters forced down and captured one of such enemy fliers, First Lieutenant Paul Zimmmer. He related the following: The favorite enemy aerial team is made up of fliers of two categories. A pilot leads the flight and is accompanied by an experienced pilot-officer who is a member of the Nazi party. This, according to Zimmmer, is done in order that the less stable fliers may always feel that they are under control. Thus, the Nazi party members, who are aviation officers, do not lead others into combat but rather play the part of a whip, which is compelling the others to fight. Zimmmer also related that Goering's order has been published in air units, especially in fighter units, which requires the shooting of fliers, bailing out in parachutes, in order to prevent their capture. These two facts are characteristic of the morale of German fighter aviation personnel.

When speaking about the operative exploitation by the Germans of their air fleets it is also necessary to mention a new method employed by the enemy. Sometimes the enemy attempts to blockade our front-line airdromes. Groups of German aircraft appear over our airdrome, adjacent to the front, at altitude

German Spring Air Tactics

[An article by Lieutenant Colonel N. Denisov, Russian Army. Translated from the Russian at the Command and General Staff School, Fort Leavenworth, Kansas, from the article "O Vesenney Vozdushnoy Taktike Nemtsev" in *Krasnaya Zvezda* 31 May 1942.]

During the war the Germans have more than once changed the tactics of their air fleets, each time with the same purpose in mind—to secure the most effective protection for ground operations. Great aerial engagements in May show that with the advent of spring the German command has again rearranged somewhat the tactics and the operational principles of its pursuit and bombardment aviation, which, apparently was based on the general situation at the front. Without making conclusions and generalizations let us review the innovations which spring has brought into the German air tactics.

During the past summer more than half of combat aviation was employed by the German command for action in great depth. At the present time, due to the increased technical power and assistance of our forces and the German efforts to provide additional fire power on the battlefield, the principal actions of air squadrons and groups of German air fleets are directed towards a closer cooperation with defending or advancing ground forces. Support of defensive action from the air is usually conducted by the Germans by means of small air units, employed on small sectors. The purpose of such action is to conduct reconnaissance or to provide protection for defensive positions. The support for groups of forces engaged in offensive action is accomplished on a large scale.

What is the operative scheme employed by the enemy in providing such support? This has been sufficiently graphically shown during recent battles in the south. Here the Germans were trying to create as great compactness as possible over the battlefields. The employment of great numbers of aircraft on narrow sectors of the front has the purpose of gaining temporary air superiority to assure the success of a given operation. It is beyond German capabilities to send up a great mass of aircraft for action in great depth and simultaneously provide air cooperation on a wide scale on the battlefield itself. Therefore the Germans strive to create temporary superiority only over the battlefield and the near rear.

As a concrete example, German counter-offensive action on one of the southern sectors of the front was accompanied by the commitment of several hundred aircraft which were unceasingly attacking our forces, air fields and nearby lines of communications. At times, on sectors of decisive importance, the compactness of enemy aviation reached as much as 25 planes to one kilometer of the front. The total enemy effort against our engaged forces amounted on some days to as many as 1,000-1,200 flights. At the same time only individual reconnaissance or bombing planes were sent against installations in the far rear.

of 2,000-3,000 meters. Coming down gradually on a spiral the group, consisting of 8-12 planes, reaches the altitude of 1,000-800 meters and closes a circle over the airdrome, trying to prevent our aircraft from taking off. An effective method of countering such a blockade is a de-blocking maneuver consisting of take-offs from the neighboring landing fields. Not long ago in one sector of the front a de-blocking group commanded by Captain Pavlovsky destroyed eight German planes and forced the Germans to abandon their mission.

Besides blockading, the Germans have begun employing two methods in their attacks on our airdromes adjacent to front lines. One of these methods consists of coordinated action by two groups of fighter aircraft: the ME-109 attack, while the ME-109F, maneuvering higher, attempts to engage our fighters in combat. In the other method the attacks are made by mixed units of "Junkers" or "Heinkels." The latter try to immobilize the antiaircraft defense elements of our airdromes.

The tactics employed in May by German bombers are also characterized by massing over the battlefield. The Germans achieve this by two methods: either they at once send up into the air a large group of bombers for a certain definite period of time, or they attack in echelons during the entire day. The principle of echeloning is as follows: at first there appears a bombing group consisting of 25-30 planes, followed—from different directions—by pairs or single planes, and the latter are again followed by a large group. Apparently this is done in order to cause us to dissipate our antiaircraft means. For this same purpose the enemy frequently practices the decentralization of his forces. Having penetrated with a large force through the front line to the object of attack, the German aircraft at first divides into groups of 7-9 planes, and, later, also into groups of 2-3 planes. It must be noted that when our fighter aviation is in action against the raid, the Germans gave up this method very quickly, inasmuch as it is more convenient to our fliers to fight the enemy in detail.

When the Germans assume the offensive, their aviation strives to direct its initial blow on our headquarters installations, centers of communications and command posts, and this is preceded by a detailed aerial reconnaissance. Thus, for instance, one of our army headquarters was the subject of intensive reconnaissance for ten days. Just before the start of the offensive the populated point, where the headquarters was situated, was subjected to an attack by a strong group of enemy dive bombers. Only good protective measures enabled the headquarters to go through the raid with small losses. Thus, with the advent of spring and intensification of German aerial activity the question of camouflage and secrecy of our troop concentrations assumes poignant importance.

Enemy bombers are now employed in groups of mixed composition. They include single motored "Ju-87's" and twin-motored "Ju-88's," as well as "HE-111's." On those sectors of the front where the enemy succeeds in establishing temporary numerical superiority, other types of enemy aircraft are also employed, including transport types. Thus, the "Ju-55" and "Focke-Wulf-200" have been recently observed in bombing operations against our land forces. This method is very costly to the Germans who usually suffer heavy losses.

It is necessary to note two more important facts in the German spring air tactics. Firstly, the enemy aviation has greatly increased the altitude of flight. Infantry weapon fire, widely employed by our forces, frightens German fliers. This is why they climb so high. The Germans execute bombing attacks from altitudes of 2500-3500 meters, in most cases, whereas earlier they kept to 1,000-1,200 meters. Secondly, many instances were observed when German bombers defended themselves against attack of our fighters by releasing small-size bombs suspended from a tiny parachute. This bomb is carried behind the plane by air current created by the propeller. Thus is defended the rear part of the plane from our fighter attacks, while the upper portion of the plane is protected by machine-gun fire.

As to fighter aircraft it is necessary to register the appearance of a new plane—the "Focke-Wulf-198." This is a twin-fuselage monoplane with a pusher-type propeller. It carries machine guns for rearward firing. Our fliers have already shot down several of these planes when the latter were engaged in reconnaissance. The Germans have not yet sent them into combat. At times the enemy send their "ME-109F" not only for action over the battlefield, but also in those directions whence our fighter planes may appear. This was frequently noted during action invoking air protection for a river crossing on the southern front. Therefore, our routes into the zone of protection should be so selected as to parry German attempts to overtake our planes while the latter are enroute to their destination.

Field Artillery in the Attack

A Plea for the Offensive Spirit—with some practical points.

[From the *Journal of the Royal Artillery* April 1942.]

1. Artillery is called a supporting arm. This suggests that its function is in some way secondary—to back up action initiated by the infantry. It may be argued, however, that in fact, artillery is the main and infantry the supporting arm—that infantry merely occupies the ground which the artillery has conquered.

The compromise between these half-truths is achieved by using the word cooperation. And the idea of a cooperation does not exclude friendly rivalry between the arms.

2. Initiative. Artillery has a greater power of initiative than infantry because:

- (a) it can strike at the enemy from positions far back within our lines—probably with impunity;
- (b) it can carry the battle deep into the enemy lines, far beyond the range of infantry weapons;
- (c) it can produce a big punch;
- (d) it can land this punch in a variety of places without moving its own positions;
- (e) it can use the weapon of surprise better than any other arm—not excluding the R. A. F.

It follows that artillery should take the lead in the attack and should exhibit a ceaselessly offensive spirit.

3. Artillery in action is a formidable thing. Artillery on the move is a column of mechanical transport—rather more awkward than ordinary transport and just as vulnerable. Artillery should aim, therefore, at being continually in action. This is, of course, impossible, but the aim can suggest the policy.

4. General principles of artillery policy.

(a) There should be the maximum number of guns in action, the minimum number on the road at any given moment.

(b) It is not sufficient for guns to be in action—that is, with trails on the ground. They should be active. There should always be some shells falling in enemy country. If observation or communications are temporarily suspended use should be made of predicted shooting.

Such "blind" shooting should normally be on areas remote from our own leading troops; not so much for safety rea-

sons as because close shooting may prevent our infantry from patrolling or filtering forward.

(c) A move, when it becomes necessary, should not mean a diminution of artillery activity. Some guns should remain at the old positions while others move to the new. The guns remaining behind should increase their average rate of fire.

(d) When a new position is occupied fire should normally be opened at once—i.e., as soon as the first gun is ready. The others will be ready by the time the first gun has finished ranging.

5. The early opening of fire. By ranging on a target as soon as his first gun is ready the troop commander achieves the following results:

(a) harasses the enemy and may cause casualties;

(b) improves his ability to engage effectively any opportunity targets which present themselves;

(c) maps the landscape by establishing intersections between gun bearings and O.P. bearings—(no other arm can do this);

(d) discloses the enemy's dispositions, since a few rounds fired at a house, a banked lane or a hedge row will often provoke movement;

(e) discovers the meteor correction of the moment.

6. The enemy's reply. The Germans are credited with a counter battery service which is technically efficient and well organized. This need not deter us.

It is only in static warfare that destructive shoots are likely to be staged. Most of the counter battery work will be in the nature of neutralization by bursts of fire at irregular or, since we are dealing with Germans, regular intervals. Such neutralization should be accepted and the men withdrawn for the 15 or 20 minutes necessary, unless an urgent task is on hand for the guns.

When quiet reigns again the troop commander should resume shooting in the sure belief that his enemy battery will be now engaged on another C.B. task. For there will always be more guns engaged on a field artillery role than there will be counter battery guns allotted to deal with them. He should, however, have an alternative position ready in the neighborhood, and should occupy

MILITARY REVIEW

it by stages if he is convinced that he has been marked down for destruction. The enemy's C.B. staff may as well be given a new job. In any case the more guns and shells the enemy uses against the artillery, the less he will have for use against the infantry.

7. Ammunition supply. A policy of continuous activity depends on a continuous supply of ammunition. It is impossible to forecast in figures what the requirements will be, but the general principle that every round fired should be replaced with the minimum of delay covers all eventualities. But it should be emphasised that the replacements must be at the gun.

A table which reads something like this:

| | |
|------------------------|--|
| 1 round in the tray | = 6 in the box. |
| 1 round in the trailer | = 12 in the Quad. |
| 1 trailer at the gun | = 2, 4, 6, etc., at the wagon line (the number varying as the distance). |

would have some practical value if it could be compiled. But unfortunately ammunition supply is not an exact science.

If figures of minimum requirements must be given they should be based on the probability that the firing will include deliberate, observed shooting and occasional fire planes—barrages or concentrations. A short barrage plan to cover an advance of 600 or 700 yards will use about 45 rounds a gun. That number will suffice for 15 minutes of concentrations at normal rates. For deliberate observed shooting 25 rounds a gun should be sufficient. So that 70 rounds a gun—at the guns—is a fair ideal to aim at.

8. Economy of effort. This is not the same thing as economizing ammunition, though it has that effect. It consists in, among other things:

- (a) not using four guns when two or one will do;
- (b) not using hundred pound shells when twenty-five pound shells will do;
- (c) not continuing to fire on a target after it has been destroyed;
- (d) not trying to destroy when disassembly or neutralization will suffice;
- (e) not moving guns forward when the enemy is still well within their range;
- (f) not having to do the same job twice.

Economy of effort is achieved by thought in making the plan, care in drafting the orders and intelligent co-operation of all concerned in carrying them out—with one additional proviso, that the object must be a worthy one.

9. Waste of ammunition—with some remarks on prediction. Observed shooting—starting with one gun ranging and stopping when fire for effect has had effect—is the form of artillery activity which wastes least ammunition. "Concentrations" of long duration carried out at short notice probably waste most. There is bound to be some waste with unobserved predicted fire, but this can be minimized by careful survey and meteor corrections.

It is often objected that predicted fire from a 1-inch map can never be worthwhile. This is a pessimistic view since the map spottings should always be within 100 yards of the correct positions and may be within 20 or 30 yards. A measure of search and sweep may be included in the program to allow for the doubt. It should be remembered moreover, that if only one round out of 20 or 30 is a hit or near miss, the remaining 19 or 29 will harass the enemy, i.e., will add to

his discomfort and effect his movements. Therefore they are not entirely wasted.

Night firing or firing on back areas must be predicted, but it is important that the enemy should not be able to predict it. If we put down a burst of fire on a cross roads regularly every quarter of an hour, the enemy's transport can be passed through in the quiet intervals. Eccentricity and irregularity should be our systems in all harassing fire programs and area shoots.

In general the rule about wasting ammunition is "Don't." But see par. 4 (b).

10. Infantry as the supporting arm. (This subhead is not written in a spirit of paradox, but rather to emphasize that "support" is a mutual obligation between the arms).

(a) Artillery can conquer but cannot occupy the ground. Infantry should support by following up the artillery attack closely, and by leaving no ground uncleared. "Islands" of resistance can be dealt with by artillery, but that means that the work has had to be done twice. Close following up obviates this necessity. This function of infantry will be predominant in a steady methodical advance against organized defenses.

(b) In warfare of a more fluid type, where "mopping up" is never complete, infantry should be responsible for protecting artillery on the move by picketing the crests and flanks generally of roads by which the artillery—that column of helpless M.T.—is advancing. After all, it was regarded till recently as axiomatic that artillery required infantry escort. Today artillery undertakes its own all-round defense when in action. It only asks for help when in action. It only asks for help when on the move.

11. The last war and this. It is a traditional gibe against the British Army that it always tries to fight a new war with the tactics of the old. We can laugh this off by pointing out that the Germans also are using their tactics of the last war—infiltration and the attack in depth which nearly defeated us in 1918. Moreover, the new weapons which the Germans are using are weapons which we used against them in the last war. It seems, then, reasonable to suggest that we also might profitably revive some of our methods of the last war—which we won.

Readers of Ludendorff's "War Memories" cannot fail to be struck by his continual complaints of the superiority of the British Artillery to the German. (And this was not merely superiority in weight of metal, but also in skill. For instance, the German Artillery gave up using shrapnel in 1916 because "such delicate work was unsuited for untrained soldiers." "Our untrained gunners" continued to use it to the end).

The quotations given in the Appendix of "War Memories" refer only to the tactics of the big offensives, but last war gunners will recall that from 1916 onwards our artillery was seldom inactive. Registration, sniping at Huns wandering in the open, methodical shoots at loop-hole plates, bursts of fury against mortars or mere knocking about of parapets from excess of spirits and ammunition—these activities occupied our days. And for the nights brigade used unfailingly to send round harassing fire programs.

To win this war let us, by all means, adopt what is good in German methods. But do not let us forget the power of attack which lies in our artillery.

German Engineers in the War

[An article from *Memorial del Ejercito de Chile* November-December 1941. Translated from Spanish at the Command and General Staff School, Fort Leavenworth, Kansas.]

In the organization of the new German army, a great deal of attention has been given to all sorts of military equipment. The equipment of the engineers, also, which is particularly varied and some of it of a type requiring special training in its use, was improved and added to.

For use in battles involving the crossing of water courses, pneumatic rafts of various kinds were introduced and new bridge trains formed capable of meeting the requirements of any troops and of constructing bridges which would carry any load. In addition to this, the new equipment permits the construction of a bridge in much less time than formerly.

The equipment to be used in the construction of fortifications, wire entanglements, etc., has been greatly improved, and various machines have been introduced as, for example, saws, some of automatic type for the felling of trees and machines for the rapid construction of trenches, etc. Engineer units were also supplied with earth mines which were rapid and effective in the removing of obstructions.

In addition to their being helped by all the means at the disposal of the modern world and motorized, to a large extent, these troops were greatly increased in numbers in spite of the fact that the engineer units already existing as in-

tegral parts of other organizations were being given much more intense instruction than in the past and were able to take care of almost any job with the means at their own disposal.

In addition to this, "Special Construction Troops" were created for the purpose of taking care of the work in the rear of the front, thereby freeing the other engineers of the necessity of taking care of certain duties which had formerly fallen to their lot. Then finally, there was created, the "Technical Aid Service" which could be called on for help in the case of unusually difficult jobs of bridge construction, for providing supplies of electricity or water, etc., the "Labor Service," and the great "Todt Organization" which had made a name for itself in the rapid construction of the Siegfried line. Special units were also assigned to the railroad troops for the rapid repair of tracks and stations.

Thus, those troops who are, properly speaking, engineers, serve principally the operative unit to which they are attached. Every division has its engineer unit which forms an organic part of the division, but in addition to this, the corps, the army, the army group and the army high command possess other special engineer units to be used in cases of necessity.

During the time when no major action was occurring on the eastern front, the

FOREIGN MILITARY DIGESTS

German engineers spent their time completing the works of the Siegfried line and in extending it northward. Besides, in the guerrilla warfare which was continually in progress in no man's land between the two fronts, the engineer played an important part with the units of assault patrols whose task was to seize important points in the terrain, destroy or occupy advanced enemy positions or seize prisoners. This work has given them a very useful schooling in the task of taking fortified positions. They made frequent employment of ground mines and at the same time they learned the art of neutralizing the mines planted by the enemy.

When the offensive began in 1940, these troops made use of the lessons they had learned during the Polish campaign of 1939. The engineers also learned much from the operations in Norway owing to the particular features of this theater of war which was made up of high and rocky mountains and covered with ice and snow. In Norway, during the German advance from Oslo in the direction of Drontheim and Bergen, the first job of the engineers was the reopening of roads. Both these and the railways had been blocked by the Norwegians over distances of many hundreds of kilometers. These roads not only had to be repaired but the work had to be done rapidly, for a rapid occupation of the southern and central parts of the country required by the coordinated plan of operations was possible only with relatively intact lines of communication. In these operations the engineers were faced with tasks which were entirely new to them, the same at Narvik where the German unit in command of General Dietl was forced to defend itself in a very unfavorable region against an enemy of great numerical superiority.

When the eastern campaign began, the engineers played a very important part in the reduction of the numerous fortified enemy positions. A large proportion of the works were taken in close range fighting. While artillery with very flat trajectory poured their fire into the ports of the fortifications, the engineers crawled forward on their stomachs armed with special equipment for this kind of fighting and annihilated the defenders. In the case of large works, larger groups of engineers were assigned to the task. The fort Eben-Emael, for example, was taken—after parachute troops had established themselves in the extensive area of the fortification—by an assault group made up largely of engineers, on the following day.

During the course of the attacks against the various enemy works, it was necessary to cross numerous water courses. The engineers had an extremely varied and major part in these operations. On 13 May they made a surprise crossing of the Albert canal in pneumatic boats and blew up three small works which dominated the canal. Afterwards, the attacking division was able to cross this obstacle, almost without losses. When the 7th Army crossed the upper course of the Rhine on 15 June 1940, in spite of the fact that the stream was very wide and swift, large numbers of engineers took part in the operations. Their motor driven assault boats crossed the river after intense preparation by the artillery, in spite of the intense fire of the fortifications situated on the opposite shore and carried the first troops across, who immediately formed a small bridge head. They afterwards continued to transport troops

across with all the means at their disposal, until finally the bridgehead was increased to the point where it was possible to construct a bridge. During this action, the engineers not only transported men and light weapons rapidly across the stream, but also heavy weapons and tanks. As regards the construction of bridges, the engineers performed wonderful feats during the campaign, not only from the point of view of the speed of their work, but also from the point of view of the capacity of the bridges themselves.

When, on 13 June 1940, the French in the western and central parts of France were in full retreat, and the Germans had taken up the pursuit, the engineers attacked the enemy continually, from front line positions. Their mission was to prevent the enemy from taking advantage of the rivers and establishing new defense lines. The advance engineer units repeatedly seized the bridges before the enemy had time to blow them up, thus assisting the Germans in their continuous advance. But, wherever a bridge was destroyed, very little time passed till means of transportation and bridge trains arrived, and the Germans were again in pursuit of the French before they had had time to organize their defense positions. The fact that the German troops reached the Gironde so soon and without serious battles, is largely due to the excellent work of the engineers. Examples of the same kind may

be mentioned in the Balkan campaign and, to an even greater extent in the present eastern campaign.

It is not the fact alone that these engineer units are so well trained in their work that is responsible for the fact that they have played so large a part in the present war of movement, but their successful work is also due to the fact that they form an integral part of the fighting forces themselves. This principle is the dominating principle in both individual and unit training. The fact that the engineers are always on hand in the front lines and wherever else their cooperation is needed at the opportune moment, is due to this principle. This principle has inculcated a very high order of combative spirit and morale in the various units of this arm of the service. This and the fact that throughout the whole of the German army there exists a very high opinion relative to the abilities and mission of the engineer troops as also the fact that no commander who has engineers under his command uses them for secondary tasks but reserves them for missions of great importance which are assigned to them regardless of the danger that may be involved, has been the cause of the ideal cooperation between the engineers and the other arms of the service.

The German type of combat is based on this close cooperation between all arms.

Artillery Support for Tank Attack

[An article by Captain V. Smirnov, Russian Army. Translated from the Russian at the Command and General Staff School, Fort Leavenworth, Kansas, from *Krasnaya Zvezda* 4 April 1942.]

During an offensive action in which all arms are taking part, tanks and artillery act jointly. The shock power of armored vehicles and strong artillery fire can break any enemy resistance, demolish all the main enemy positions blocking the infantry and assure the latter's success.

By examining the battles on the southern front, let us discuss certain questions of cooperation of artillery and tanks during offensive action. Practical experience shows that this is not always given sufficient attention.

A certain infantry unit was to have occupied a populated locality, which was an enemy strong-point. The commander of a force of all arms decided to begin the attack at dawn. The tank company was given instructions as to its jumping-off position, route during combat and objective. But the plan did not provide artillery support for the tanks, due to the fact that there was little time left for the preparation. It was assumed that, in the course of the engagement, the situation itself would dictate the methods of tanks-artillery cooperation.

What really transpired on the following day? Even while moving into the jumping-off position the tank company was subjected to enemy fire. When the tanks began to move towards the flanks of the strong point, the enemy antitank guns, which previously were noticed either by the infantry or the artillery, opened fire. The tanks had to halt and silence the antitank guns by the fire of their own weapons, stopping altogether at the approach to the cut-off position. The route here was blocked by a snow covered antitank ditch with icy walls.

As the tanks stopped they became targets for the defensive antitank guns behind the ditch. The infantry unit and the artillery were not prepared for the immediate establishment of fire cooperation with the tanks. After suffering some losses the tanks had to return to the starting position.

Why did this attack fail in spite of sufficient number of men and matériel? The main reason is clear—the absence of coordination between artillery and tanks.

When tanks engage in combat the main mission of artillery is to destroy the enemy antitank means. Such tasks as liquidation of enemy nests of fire, interfering with the progress of the infantry, and the clearing of passages through barbed wire entanglements, may be taken up by tanks. In order to utilize the power of artillery and tank-gun fire to the greatest benefit and advantage, complete understanding is needed between the senior commanders of these arms.

In addition to participating in the reconnaissance of the commander of a force of all arms, the commanders of the tank and artillery groups should jointly conduct a special reconnaissance. It is most important to ascertain on the terrain the starting position and route of the tanks, their mission and assembly point, when and from which position the artillery will begin fire support for the tanks. Besides this, the artillery commander informs the tank commander of reconnaissance results, such as what obstacles have been discovered along the route of the tanks' movement, and, in this connection, of what kind is to be the

MILITARY REVIEW

artillery support. At this time it is necessary to establish the call signals for the opening or transfer of fire, and in the event of unexpected developments. As a result of joint reconnaissance it will become clear how the artillery is to be distributed and what may the tanks expect and demand of it.

Artillery acts against enemy antitank weapons by firing from concealed positions (preparatory fire against enemy targets, fire protection for own concentrations, support by concentrated fire) and from open positions, as well (close accompaniment of own forces, repelling enemy counter-attacks). The skill of the artillery commander must be expressed in the precise organization of combat work of small units, flexible direction of their fire and movement. The basic organizations where the questions of cooperation are solved in practice are artillery groups assigned to the support of infantry battalions. Before the start of the tank attack these groups cover their initial move to the jumping-off positions, while at the same time executing the requests of infantry unit commanders. Particularly, heavy artillery battalions open counter-battery fire against previously discovered enemy batteries in the sector of the proposed tank attack.

The principles of artillery in offensive action remain unchanged also when tank elements take part in the attack. Let us take up the question of the nature of fire. During the entire engagement the fire will be aimed. Its consistency and intensity depend on the nature and importance of the targets and on their distance from the tanks. The fire of one and perhaps of two artillery battalions will be needed against the most important targets situated in the most dangerous directions. The tempo of fire should reach its greatest intensity just before the attack is launched. It is very important that the enemy OP's should be destroyed.

It will be advisable to move individual antitank guns in advance, as close to the enemy as possible, and along the route of tanks, utilizing for this purpose every terrain feature. This will serve to counteract the well known difference between the mobility of tanks and guns and will enable to more speedily dispose of enemy nests of fire.

How is the artillery support of tanks to be organized during the course of the attack? Above all, it should be uninterrupted, which is dictated by the very nature of artillery offensive action. Practical experience has shown that mobile curtain fire is inadvisable. When distributing bursts on the field of fire the result obtained fails to justify the expenditure of ammunition. Most acceptable are successive concentrations of fire on checked targets or groups of such targets. Who is to be brought in for such concentrations of fire and how long is such fire to be continued? Initial figures for these calculations will be provided by the results of reconnaissance of all kinds (observation, photo-mosaics, etc.). In all instances short but powerful fire attacks will be executed against objects situated close to the route of tanks.

Individual guns moved forward ahead of time under the protection of infantry begin to fire as tanks approach the outer edge of the defensive zone. Before this these guns will not betray their presence, no matter how enticing the target might be. Moving by leaps from position to position the gun crews maintain close observation of the field of fire, silencing revived and newly discovered enemy

nests of fire by firing at the latter with open sights. Such support is tremendously important. The gun commander, informed in advance of the mission of tanks and having made certain the procedure of accompanying and supporting the latter, will free the tank crews from the need of acting against every enemy position. It is much easier for artillery to observe and fire on the ground than for the tank crew to do so from their vehicle.

As the front line of resistance is breached, the engagement becomes very heavy, targets increase and the frequency of enemy counterattacks grows. The artillery control is decentralized, the role of individual guns becomes of increased importance, especially in combat for the possession of a populated point. In such a situation tanks will use bursts of tracer ammunition to indicate targets to gun personnel.

Fire cooperation between tanks and artillery must not cease even for a minute. The most important thing is for artillery not to fall back of the tanks more than the distance of effective fire. Leaps of 300-400 meters will be most conven-

ient. When it will be necessary for the gun to make the leap forward, its commander will signal the tank crew and the latter will provide fire protection for the gun. Another variation is possible when there are many supporting guns on a narrow front. In such a case the guns execute their leaps singly or in pairs under the cover of fire of the other guns as well as of infantry weapons (especially trench mortars).

When combat becomes prolonged in the depth of enemy defense, tanks may stop at the interval collecting points. Here they will receive additional missions, restore interrupted liaison, etc. It is important to protect tanks at such halts. Both the artillery commander charged with support of infantry, as well as every gun commander, should take measures for protecting the tanks from possible counterattacks. When organizing circular defense of the assembly point, protecting weapons are placed, above all, in directions whence enemy tanks might come.

As the tanks complete their mission, the entire artillery reverts to the direct support of the infantry.

Spring Tactics of Enemy Bombers

[An article by Lieutenant Colonel T. Guba, Russian Army. Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the article "Vesennaya Taktika Bombardirovshchikov Vraga" in *Krasnaya Zvezda* 26 April 1942.]

Recent combat experiences show that the summer cadres of the German aviation are now much weaker than before. The most seasoned German flying units have been destroyed on the Soviet-German front, and the new ones lack experience. The former haughtiness and impudence of German fliers has disappeared. They have become more cautious. All this has, of course, affected the tactics of enemy aviation. The Germans now concentrate their main aerial tactics against our land forces. This is caused by the fact that the enemy is trying to render all help to his land forces, which are suffering great losses.

However, enemy bombers are employed with greater caution also directly over the battlefields. This is explained by the increased activity of our antiaircraft defense. The German "Junkers," while approaching their targets as before from behind clouds or from the direction of the sun now disengage their motors. The enemy is trying to attack suddenly, seeing in this method, among others, the means of reducing his losses.

The Germans now bomb in salvos. That which was seen last year—prolonged tarrying of enemy bombers over a target and bombing it several times—has now disappeared. Dive bombing is encountered with growing infrequency. In thirteen cases of bombing, observed on one of the sectors of the front, only two were diving attacks, and these not by the full formation of bombers but by individual planes. Dive bombing was executed from 1,500 to 1,800 meters and would reach 100 meters followed by a sharp swing upward towards the sun. As a general rule, however, the enemy dive bombing has been replaced by bombing from horizontal flight. This is the result of the antiaircraft measures of our forces, which are employing all weapons including rifles. On the other hand this shows the low qualification of German fliers.

Formerly bombing from low level flight was frequently observed. Now the altitude for bombing has increased. As a rule the results of aerial bombing are meager. The Germans even miss large targets. Whenever intensive antiaircraft artillery fire is present the enemy unloads his bombs without aiming.

In executing a maneuver against our antiaircraft artillery enemy bombers either change their course 20-30 degrees sideways or, which is most frequent, they come down to 200 meters.

On our sector of the front enemy bombardment aviation is usually employed in groups of 6 to 12 planes, frequently accompanied by a strong force of fighters. Everyone knows about the aerial engagement of seven of our fighters under the command of Captain Yeremin against 25 German planes. In this case 6 enemy bombers had the protection of 19 fighters.

The formations of enemy bombers remain the same as before. As formerly we encounter the wedge (V), bearing (translation uncertain) or the extended bearing (translation uncertain) formations. The method of fighter protection, however, has changed.

Fighters engaged in protecting bombers are employed, as a rule, in two groups. The first group proceeds on the side, in the immediate vicinity of the bombers and 500-600 meters above the latter. The formation of this group is a wedge of flights of three planes each. Apparently its tactical mission consists of providing direct support for bombers.

A second group (usually half the size of the first) proceeds over the formation of bombers, in front or in the rear of the latter, and much higher (1,000-1,800 meters). This group is composed of qualified fliers. They do not engage in combat but execute dive attacks against our

individual planes which in the course of the battle, break away from their formations.

Knowing enemy tactics our fliers keep in a compact formation all of the time. Six of our fighters commanded by Major Bukalov flying in a compact formation, encountered a great number of enemy aircraft and attacked them. When Major Bukalov's group shot down one enemy bomber and two planes from the fighter protective force, the other enemy planes turned and fled. The enemy fighter group flying higher was also compelled to retreat because none of our fliers broke away from the formation.

When encountering our fighters German bombers also make efforts to shorten the intervals in the formation. Bunching up they try to make maximum use of

their machine guns. They open fire at a distance of 700-600 meters.

An attack by our fighters usually forces enemy bombers to return to their own territory. In doing this the bombers try to maintain their formation and fly at higher speed. Bombers flying alone when attacked by our fighters not only increase speed, but also drop to lower altitude and proceed at low level.

New method in enemy aerial tactics is observed in action of their fighters, which our fliers have named "roving." These fighters, flying in pairs 50-80 kilometers inside of our territory, seek out our planes flying singly, and attack them. These enemy craft usually fly at 3,000-4,000 meters and hunt for our liaison planes. Therefore, the greatest vigilance is absolutely required of our aviators.

The Fuehrer's General Staff Officers

[An article by Otmar Best, War Correspondent. From *Deutsche Allgemeine Zeitung* 11 June 1942. Translated from German in the War Department, Washington, D. C.]

(PK) Crimean Peninsula,
May, 1942.

Only two days ago there were Russians in this peasant home. Now it serves to accommodate the staff of the advance command post of a German Army Corps. The encounter battle, that is, the final battle for a tongue of land extending northeast of Kerch, can be reached from here by telephone and radio; and besides—though such could not everywhere be the case—we are able to get a full view of its entire extent. Within record time the necessary transmission lines were laid down. From this peasant home the commanding general is directing his divisions. The room is decorated with numerous family photographs; but more impressive than anything else, down here on the lower Crimean Peninsula, are two loudly colored prints representing nothing more than two scenes from Romeo and Juliet; the balcony scene and the death scene. But all this, no less than chair and table and the antiaircraft protective ditch outside the house, has become quite unimportant in comparison with two pieces of furniture which at the moment dominate this primitive room; the map table and the field telephones. The commanding general, and a major wearing the red stripe of the Ia, are working here in perfect adaptation to one another's method, capable of communicating their intent by merely a brief word or glance, assisted by other officers. The chief of the general staff of the army corps has orders to be on duty this day at the former headquarters, so as to free the commanding general of all other duties, enabling him to devote undivided attention to the battle action in progress. Tomorrow or the day after they are expected to exchange places. In fact, the battle action in progress, laid down in detail by orders according to extremely careful preliminary discussion, requires a maximum of concentration also for these headquarters. It is a fundamental principle, to be sure, that at this stage of the game a maximum of initiative will be left to the divisional commanders. It will be unavoidable, however, for progress against the enemy to be more rapid at one point than at another, with the result that slight modifications of the battle plan become necessary. A decision will have to be made,

for instance, whether or not the fliers, whose liaison officer is present at the headquarters, are to be sent into action sooner or perhaps later than anticipated by the plan as originally drafted; and it has become necessary also to decide whether the flank of one of the divisions is to be relieved by use of reserves or by a renewal of attack. A possibility exists, moreover, to provide orientation for the divisions now approaching, by re-laying to them, via army corps headquarters, information concerning neighboring units. Or at any rate, it should be possible to complete the available information.

It is perfectly amazing to observe how promptly the ever-changing picture of the military situation is brought all the way to this point with the aid of the miracles of modern military communication services. It would be inappropriate to describe details. But one might at least mention that the content of a radio message from the frontmost lines reaches the staff of the army corps literally no more than a few minutes after it is sent. The general command maintains uninterrupted connections with the general staff officers of the divisions, and often with the commanding officers themselves; and, on the other hand, it constantly passes on reports to headquarters of the army and receives further orders from that source.

Very little is said, as a rule, of this general staff work, which is carried on in a similar manner at a hundred different places at the various fronts. The general staff officer still continues to be educated according to the principles of Moltke and Schlieffen: "To be more than to seem." But his work deserves public mention at once, today, without having to wait for the future historians of the war. The work of the Führer's general staff officers is done in the shade, so to speak. For many years they have been living examples of the principle: "To be German is to do a thing for its own sake."

In the military hierarchy, the division is the lowest unit in which general staff officers perform their duties. After that come the red stripe officers serving with the army corps, the armies, army groups, in the general staff of the army, and in the general staff of the armored forces and the Führer's own headquarters. This arrangement for conducting operations

was in part taken over from World War times; but certain features—above all the general staff of the armed forces, which includes officers from all three main branches of the armed forces—have been newly created since that time. The number of units included under one of the more comprehensive units is not absolutely invariable; thus an army corps can be composed either of two or more divisions, and an army might include two or more army corps. The number of subordinate units will depend on the strategic purpose to be attained; at the eastern front it will to some extent be determined also according to possibilities for the use of allied troops and volunteers. At the eastern front it is necessary to operate with a number of different army groups, because, as Clausewitz remarked long ago, an exceedingly lengthy front would be hard to watch and difficult to manage. A few significant keywords will suffice to suggest the tremendous amount of labor to be accomplished in leading bodies of armored troops including millions of men through enemy country; everything that is needed has to be made available in time; there should be no lack of forces nor any crowding of forces; cooperation must be effected with the air forces and in case of necessity with the naval forces; preparation has to be made for resupplies of ammunition, fuel, food, supplies, and reserves of manpower; medical service has to be provided for these huge masses of troops, and casualties and other patients have to be provided for these huge masses of troops; in fact, everything must be done to prevent illness; and then there is the problem of clearing the terrain and putting things in order, not to mention the repair of railroads and highways. It is an unbelievable task that has to be accomplished and all the heroism of the infantryman fighting at the front would be in vain unless this work is accomplished. The foregoing considerations will serve to show at the same time how great a damage was inflicted upon the Bolshevik army when as a result of our victorious battles an essential part of the corresponding apparatus of their own army was again and again knocked to pieces; and this holds true especially in view of the fact that their army operates in a country where intelligence has been exterminated and where in that respect even the armored forces have to get along with mere improvisation.

The organization and structure created for the work of the general staff offers the key for the mysterious relationships which are so difficult for the layman to understand: Ia, Ic, O., Qu., B., V.T.O., etc. In the last analysis there is little that is mysterious in these designations, all of which have gone through a historic course of development. Once one has clearly understood the nature of the units that make up a division; the rest is very simple; in the division, the Ia is the first general staff officer, the man who works out plans for the division's own tactical decisions; Ib works on supplies; Ic makes a study of the enemy situation. At the general staff of an army corps all divisions operate under the chief of the general staff of the army corps, who performs the duty of an assistant to the commanding officer. He has, as an assistant his own Ia, a member of the corps. The higher general staff officer who is in charge of supplies and corresponds to the Ib of the division is called the quartermaster. His task is a very comprehensive one. The officers concerned with the study of the enemy situation (and his work in-

MILITARY REVIEW

cludes a great deal that is unsuited for public report) is called the Ic in the army corps no less than in the division. The next higher unit, the army, likewise has a chief of the general staff with a Ia and a Ic. In a unit designated as army the higher officer in charge of supplies is called the chief quartermaster. In addition there must be mentioned certain other general staff officers who are added according to need, as well as the higher officers belonging to the different branches of the services, as for instance the pioneer chief of an army, the intelligence chief, etc.

The supply system of the army as a whole, inclusive of medical and veterinary services, is under the direction of the chief quartermaster, subject to directions of higher leading officers of that army. As a matter of fundamental principle, therefore, the leading staff of an army comprises two separate branches: the branch of military command, and the chief quartermaster branch. This means that we are again meeting here, though in more broadly organized forms, with the same principle of organization as that which is applied to the staff of the division. According to ordinary usage if reference is made to the chief of an army, reference is intended not to the commander in chief himself, but to his chief of staff. Possibly it is confusing for the layman's mind to this very day, that Ludendorff, although in the highest general staff of the army he held the title of first chief quartermaster, had nothing whatever to do with the affairs of the quartermaster department, but was in charge of operations. The staff of a group of armies is composed in a similar manner. The organization of the general staff of the armed forces is not subject to public discussion. The enemy has at all times endeavored in vain to conquer this form of organization. At the head of the general staff of the army is Colonel General Nalder; General Field Marshal Keitel is the chief of the high command of the armed forces; and General Jodl, of the artillery, is the chief of staff of the command of the armed forces. The command of the air forces has its own general staff; and the navy, likewise, has its own general staff, for the conduct of naval operations. Generally speaking, military coordination is much closer in the highest brackets of the command than it was during the World War, when the general staff of the field army did not by any means exercise the authority ascribed to it by public opinion.

The hardships of training for the general staff and for the navy have always been very great. But the choice of men secured in this manner has always made it possible to fill the highest positions with highly qualified officers. It was a great good fortune for our Germany that even during the years of disarmament, the idea of maintaining a general staff and training its officers was kept alive; and Colonel General von Seeckt, although he had under him no more than 96,000 men and 4,000 officers, prepared his staff to take over the leadership of armies including millions of men, and it was similarly fortunate that since 1935 the country was allowed a few years' time to build up a new general staff, and that our colonel generals and general field marshals of today are in most instances officers trained in general staff duty during the first World War. Since the outbreak of the war it has been found possible, likewise, continuously to provide for well-qualified replacements.

It is a bracing experience to watch a staff like this at work during decisive hours, or on one of its quieter days. How carefully every detail is thought out; how all these details are woven together into a living whole. How things affect one another and live in one another. And all this work is carried on in a conversational manner expressive of mutual esteem. One short word—perhaps forcefully expressive in soldierly fashion, perhaps discreet and remotely suggestive—may prove sufficient to clear up a difficult situation, a possibility that could not exist without the army's tradition, which has proven its worth for one decade after another and has also served to give emphasis at all times to the training of character along with purely mental training. In the home country discussions are carried on commonly at the present time concerning the question of how, as the leading nation of Europe, we shall go about preparing the necessary intellectual forces that will be necessary to master the uncounted multitude of problems imposed upon us by our new position, and whether it will be possible for us to keep available in sufficient numbers a class of leaders of sufficient strength and possessed of the true qualities of masters. In this connection, the examples set by the general staff are quite essential as supplementing other exemplary factors offered by the life of the party, by general economic and economic life, as well as by the force of administrative employees. In the general staff we have an example of training for leadership carried on for a period of more than a century, a training which is passed on from one generation to another; not only by the older officers to the younger, but also by fathers to their sons and grandsons. On the achievement of the staff at the present time, the achievements of the present war have come to be regarded even now as the culminating point of this great tradition. As a rule, the general staff officers will pass in due course of time through quite a number of positions; that is, they will do duty as ordnance officers Ia, Ic, and chief of staff. Most of them, or at least the most important among them, have been thoroughly acquainted with one another for years, even as regards their more personal characteristics. It is a matter of course for each one of them to give their last ounce of strength for the service. It is an objective sort of ambition, not the desire for personal eminence that motivates the action of these officers. Although every man is conscious of his worth, it is still regarded as bad form to speak very much of one's own achievements. It has always been one of the presuppositions of this attitude, however, that real accomplishments should be duly recognized at least by the armed forces themselves.

A high ranking officer once tried to make clear to me the significance of the general staff, by saying that responsibility for thousands upon thousands of human lives is something so tremendous that one individual could hardly undertake to bear it; and that for this reason a leader of troops must have a staff to advise him (of course, without relieving him of his responsibility and his power to make a decision as commander of troops) and to work out the various details on the basis of which the responsible order is finally given. It is easy enough merely to formulate the principle that precious German blood must be spared, but that a maximum of losses must be inflicted upon the enemy. But an

incredible amount of preparation, knowledge and decision is requisite to put this principle in action; from the moment when a picture is taken of an enemy front to the moment where the center of attack is formed in actual battle; from the moment when the required pieces of artillery are put in readiness till the moment when all the different weapons are ready, and cooperate down to the last one according to schedule. Every care must be taken all the way through not to impede the initiative of subordinate leaders; because due to a sudden change of conditions they might have to modify their course of action. Such are the complications involved in the great art of command, which as applied in the highest spheres is indeed an art and not mere carrying out of regulations—and more than likely our people at home, despite all the military training in our midst, are still not sufficiently familiar with its complications. We now have, here on the Kerch Peninsula, tens of thousands of prisoners taken as a result of the destruction of three enemy armies; but we also have seen military reports concerning our own losses. These losses are hard to bear; but their favorable proportion as compared with enemy losses serves to demonstrate that our victory was the result of military superiority of our leadership. Ready to put our troops into action unhesitatingly wherever necessary our leaders are nevertheless imbued throughout with the ideal of saving life and making preparations carefully. It is easy enough for anyone to issue senseless orders causing uncounted masses to run against the enemy. Such is Stalin's method. Any Churchill who comes along is brilliant enough to work out fantastic strategy on paper, giving orders that are bound to fail in view of conditions such as they are. One is free to do so, so long as the nation permits. But in the long run, the art of leading an army does not put up with the performance of amateurs any more than does any other art.

But it is our privilege to witness a time when this precious instrument constituted by the German general staff is given into the hands of a man who manipulates it with the profound sagacity of a genius in the art of war; a man who has proven himself capable also in this field of leading our proud tradition to its point of culmination, in developing the new idea of the state. It was a matter of linguistic coincidence that even at the time of the Versailles treaty reference was made in the general staff of the training of "Führergärtchen" (aids to the leader, aids to the "Führer"); but that is precisely what our general staff officers of 1942 have been since the time when the Führer himself took charge of the supreme command of the army. Both the nation and the party are aware, no less than these men themselves, that it will be their duty to preserve an important inheritance for the future. They found out that in 1919 the enemy in destroying the old army was trying above all to destroy the general staff. They are perfectly aware that this time the enemy would not fail in another Versailles to do away with our armed forces entirely; and they know that only Adolf Hitler's victory can assure continuance of our military strength in the future. This strength we need not because of any military desire for power, but as a result of compelling national necessity in view of our situation and position in Europe—both in times of war and in times of peace.



MILITARY NOTES AROUND THE WORLD



AFRICA

The Trans-Saharan Railroad:

The accompanying map shows the route of the new, strategically important Trans-Saharan Railroad.

This road, connecting Oran on the Mediterranean with Dakar and Conakry on the African Atlantic coast, is being rushed to completion by the Vichy French authorities, who are using conscripted labor for the task.

(*Press Reports*)

AUSTRALIA

Rubber Production:

Experiments in rubber production in the State of Queensland are progressing. A pilot plant for extraction of rubber will be in production shortly. Tests with possible rubber-bearing plants have been successful, but it is emphasized that development is still in the experimental stage.

Australian chemists have discovered a method of manufacturing rubber from a combination of raw and reclaimed rubber in which six times the amount of reclaimed rubber hitherto regarded as possible can be used.

(*Press Reports*)

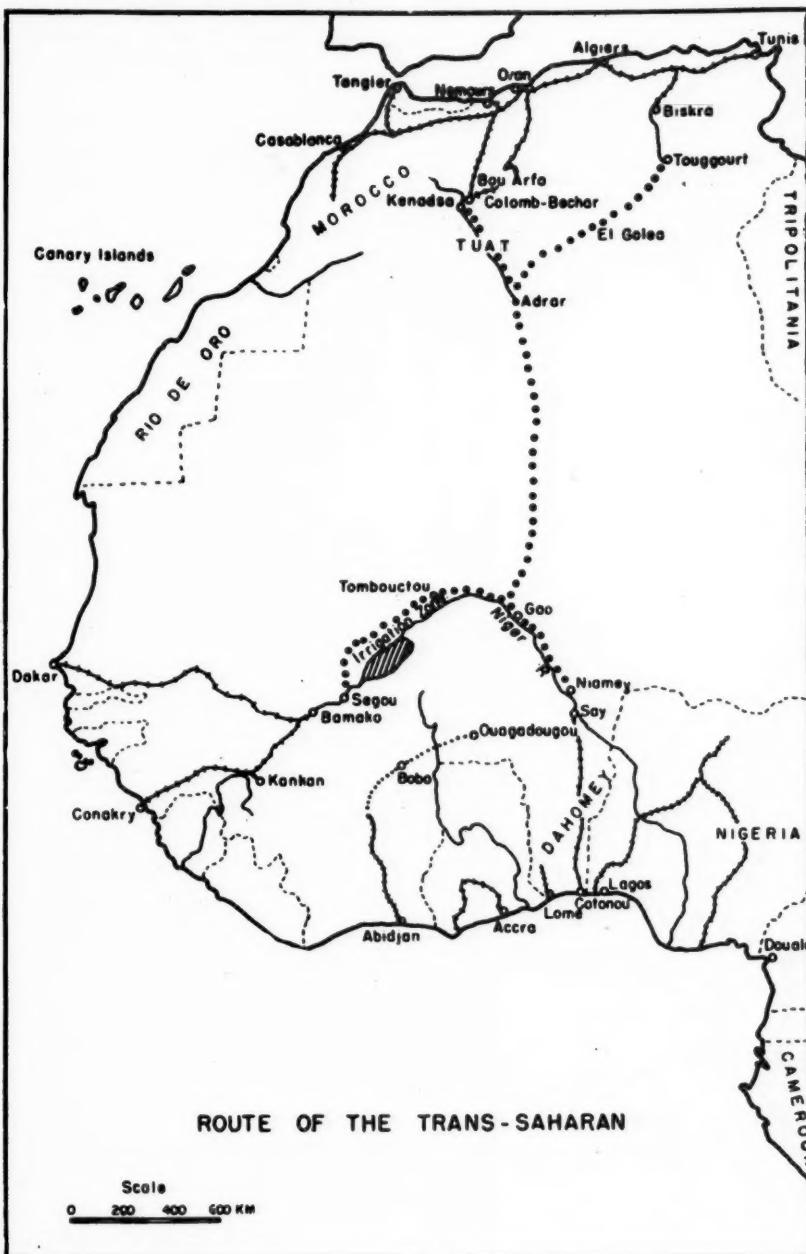
CANADA

Industrial Minerals and the War Efforts:

Canada is having difficulty in obtaining supplies of some of its deficient minerals, and, as there is little likelihood of any real improvement in the situation, every effort must be made to obtain the greatest possible degree of self-sufficiency in respect to mineral supplies. Canada's production of fluorspar, graphite, and china clay and of ores of tungsten, chromium, and manganese is far short of the requirements. There is no domestic production of piezoelectric quartz or of Iceland spar. There are many occurrences of molybdenite, but all that is produced comes from Quyon, Quebec. The entire Canadian output of chromite comes from the eastern townships of Quebec, and considerable interest is being shown in deposits of that province. There are many deposits of manganese ores in the Maritime Provinces. These are mostly low grade, and production is small. Canada has enough of most of the refractory minerals but imports most of the fire clay used in eastern Canada, most of its chromite, and part of its magnesium refractories. The chief domestic source of magnesium refractories is in Quebec. There are abundant supplies of the fluxing minerals with the exception of fluorspar, of which there is a small domestic production in Ontario and Nova Scotia. There is a large output of asbestos in the

eastern townships. Barite is produced in Nova Scotia, with a smaller production in British Columbia. Some bentonite of the high-swelling type is produced in the western prairies. There is no production of celestite or of cryolite. Some graphite is produced near Calabogie, Ontario.

Supplies of limestone are abundant, and there is sufficient production. Lithium minerals occur in Manitoba but are not developed. Ontario and Quebec have an important output of amber mica. Talc and soapstone are produced in Ontario and Quebec. The Dominion Government



MILITARY REVIEW

Department of Mines and Resources is giving every assistance in the work of bringing into production deposits of minerals required for the war effort.

(American Ceramic Society)

FINLAND

Finnish Aid to Germany:

Finland's part in Germany's war effort is significantly illustrated by three advertisements in Finnish papers. A German engineer, B. Heimbürger, asked in the magazine of the Finnish Conservative Party for skilled aircraft workers who will be employed in the Government-owned aircraft works, mostly on repairs. Hauptmann Dietrich, the commanding officer of the Pori aerodrome, advertised in another Finnish Conservative paper for draught horses and horsemen with sledges; two will be stationed at Vaharuma, two at Mantyluoto Harbor, one at Kylassaari, two in the town of Rauma, and four at Pori aerodrome.

The Luftwaffe must be in great need of these horses as the Hauptmann asked for immediate applications either personally or by telephone. The estimate for the new Finnish Budget provides 2.6 million Finnish marks for aerodrome buildings in Northern Finland, and also 1.2 million Finnish marks for repair of the damage inflicted on the harbor by bombing raids. Furthermore, 300,000 marks are required for building accommodation for the harbor's antiaircraft defense crews.

(The Aeroplane)

FRANCE

New Flying-boat:

France, according to a German report, claims to have the largest trans-Atlantic flying-boat in the world in the 161P type, which has made its first test flights. The 161P is presumably the Potez-C.A.M.S. 161, which was designed to a specification issued by the French Air Ministry for North Atlantic flying some years ago. It was to have had six 890 h.p. Hispano-Suiza 12 Ydrs. liquid-cooled motors, a top speed of 208 m.p.h., a cruising speed of 183 m.p.h., and a range of 3,726 miles against a 37 m.p.h. wind with a crew of six and 20 passengers. All-up weight was estimated at 81,400 lbs. The 161P is said to weigh 43 tons.

A flying scale model, the Potez 160, was shown at the Paris Exhibition in 1938. It was a little more than one-third of the size of the 161, and was a two-seat high-wing monoplane powered with six 40 h.p. Train motors. The top speed was 138 m.p.h.

(The Aeroplane)

GERMANY

The Focke-Wulf Airplane Fw 190:

In the summer of 1941, news filtered through of a new German single-seat fighter with a radial aero-motor. In September, 1941, the Focke-Wulf Fw 190 was reported in action over France. The first was shot down in an offensive sweep by British fighters on September 18.

Since then many Fw 190s have been met and they are obviously in service in many fighter squadrons of the Luftwaffe.

Few precise details are available yet, but the photographs and silhouettes show that the Fw 190 is a complete breakaway from previous German practice.

The most notable feature of the Focke-Wulf fighter is the 1,600 h.p. B.M.W. 801 14-cylinder two-row radial motor with fully enclosed cowling and fan-assisted air-cooling. The wings are tapered from the root and have moderate dihedral from the roots as well. The span of 37 ft. is small. Although the cockpit is shallow, there is a completely transparent hooding so that the pilot has a good field of view. The armament is not known for certain, but appears to be six machine-guns in the wings. Another point in doubt is the exact method of retracting and undercarriage. It probably retracts backwards, somewhat in the manner of the Mohawk and the Master.

In action the Fw 190 has not appeared to be very formidable. Its top speed is about 370 m.p.h. at 18,000 ft. and, although it is maneuverable, the Spitfire appears to have the whip hand in combat. The following figures are approximate:

Dimensions.—Span, 37 ft. 0 in.; length 28 ft. 11 in.; wing area, 194 sq. ft.; aspect ratio, 7.06.

Weight.—Loaded about 7,000 lbs.

Performance.—Max. speed, 370 m.p.h. at 18,000 ft.; range, 525 miles at 300 m.p.h.; service ceiling, 38,000 ft.

Points of Recognition.—Radial-motor low-wing monoplane. Wing tapered from roots with dihedral. Rounded single fin and rudder. Retractable tailwheel.

(The Aeroplane)

The Platoon:

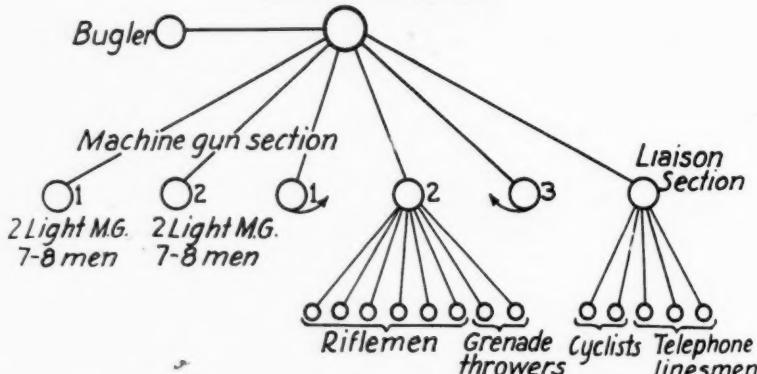
Organization of the Platoon in the German army. The platoon has 48 men. Rate of fire per minute.

| | |
|----------------------|------------------------------|
| 4 Light machine guns | 600 rounds |
| 40 Rifles | 400 rounds |
| 6 Grenade-throwers | 36 grenades |
| Totals | 1,000 rounds and 36 grenades |

The armament of the rifle platoon consists of rifles, hand machine guns, and gun and hand grenades. The type of machine gun used by the platoon is the Maxim.

(From the book "Combat Action of the Engineer Platoon," by Colonel S. G. Gurov, Russian Army).

PLATOON LEADER



Traffic Bridge at Kiev:

To facilitate military supply traffic along the important line of communication which passes through Kiev enroute to the southern front, the Germans erected a strong pontoon bridge for motor and other vehicular traffic.

It was necessary for the Germans to construct this bridge inasmuch as Soviet troops, before withdrawing from the Kiev sector in the summer of 1941, effectively destroyed the Dnieper river bridges.

Hungarian engineer troops aided the Germans in this construction work.

(Press Reports)

Salvage of Captured Planes:

In the salvage centers of the general chief of ordnance of the air force, enemy planes which have been shot down or forced to land by German pursuit planes or antiaircraft guns are studied along lines which are of interest in their successful combat. In this way it is possible to keep tab on the development and armament of the hostile craft. Thus, for instance, new protective armor which appears on them, is removed and subjected to tests in order to determine its resistance. Machine guns and cannon along with the ammunition belonging to them, found on the planes are tested for their penetration in order that German planes may be equipped with armor plate capable of resisting them. In the case of machine guns built into the planes, the angles of traverse and elevation as well as the dead angles are determined. In this way, it is possible to furnish important information to German fighter planes regarding the most advantageous angles from which to attack them. Individual features of their construction are subjected to tests and measurements and the results taken into account in the construction of German equipment. Pieces of metal or other materials are removed from the body of the plane or engine, and tested for strength. In many cases where planes have been forced to land, it is possible to get the plane into running order again, and put it through flying tests. In this manner it is possible to get an accurate knowledge of the characteristics of enemy planes, which is of great tactical value to the Germans as, for instance their speed, ceiling, maneuverability in the case of pursuit planes, range with given bomb loads, in the case of bombers. All these experiments and tests furnish the German aircraft industry with valuable directives with regard to maintaining and increasing supremacy in the air. But, especially, the air service acquires, in this manner,

valuable facts with regard to the employment and performance of these planes and successful defense against their attacks.

(Die Wehrmacht)

MILITARY NOTES AROUND THE WORLD

MARK IV: Here is the German tank that American forces are most likely to face. It is the Mark IV, backbone of the Afrika Korps and a tank-of-all-work that falls between the 18-ton Mark III and the 32-ton Mark V. It weighs 22 tons, has a speed of 23 miles an hour, and was generally outfought by Ameri-

can General Grants in Libya. Most of the Mark IVs are armed with a sawed-off 75-millimeter cannon—no match for the American 75—but in some of them a high velocity 50-millimeter weapon has been substituted for the regular weapon.

(Courtesy of "Newsweek")

While most bombers are heavy, lumbering craft requiring for protection convoys of fast fighters or the shelter of high altitudes and masking clouds or darkness, these new ships need no escort and make no attempt at high altitude flying. With military experts pinning their faith on intricate bombsights, these pilots use no aiming devices at all, according to *Science Service*.

Machine gun "strafing" from low altitudes is something European fighters have been familiar with since the days of World War I. Dive bombers are by now taken for granted. But this new sort of "horizontal bombing" from planes grazing the tops of the hedges, and whizzing by at 340-miles-an-hour speed, has provided the Germans with a complete surprise.

The British Journal *Flight* reports it as fact that the Germans are building 30-foot antiaircraft towers in order to be able to shoot down on these new bombers.

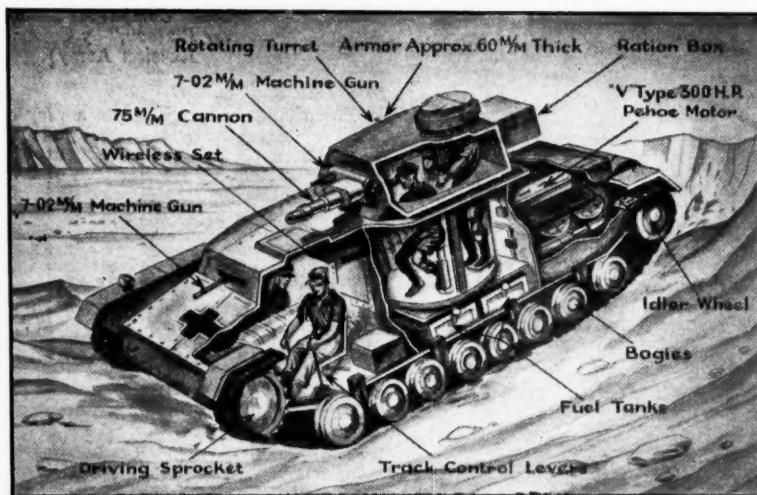
The new technique has produced its own problems in ballistics. When a bomb hits the ground from such a low height, it ricochets along the ground horizontally and hits the target from the side instead from above. This is all right for a huge target. But one pilot who watched a companion attack a railway station reports that the bombs went clean through both walls of the station and exploded harmlessly some 300 yards away.

The airplane is in some danger from its own bombs at such low altitudes. In order to be reasonably safe from the explosion of a 250-pound bomb such as those carried by the new Hurricane, an airplane must be at a greater height than 1500 feet—2000 feet would be better. To get around this, delayed action bombs that do not explode on impact are being used, and formations have abandoned their sentimental attachment for the V symbol in favor of flight abreast. If one plane flew behind the others, the last man would be blown up by the bombs dropped by the leader.

The regular procedure has been this. The planes cross the channel flying in formation at economical cruising speed. As soon as the coast of France is reached, they throw the throttles wide open and zip across country at full speed, some 500 feet per second. At this speed antiaircraft fire finds them a very difficult target, and they have approached, passed, and gone before interceptor planes can leave the ground.

The two bombs carried by each plane are both dropped at one time, some distance from the target to allow for the tendency to ricochet along the ground in the direction of the plane's flight. Before their bombs explode, the bombers are already away—and no longer bombers. With their loads discharged, these dual-personality aircraft become fighters with all the speed and maneuverability for which the Hurricane is famous, capable of dealing with any interceptor planes.

(*Scientific American*)



Newsweek

The Working Woman In the Third Reich:

Women are especially suited for tasks requiring great dexterity but not great strength. Of the working women, 69 per cent are in industry. Women are not permitted to work in places where their health might be injured by poisonous gases, dust, great heat, or vibrations; they cannot regularly lift heavy weights. In the ceramics industry, they are permitted to cast only small objects weighing not over 15 kgm. Work should be so arranged that the men do the heavy work and the lighter work falls to the women. More specifically, women are excluded from the following types of work in the stone and clay industries: (1) work in grinding, (2) harbor and stoneworkers, (3) work in mixing raw materials for glassmaking, (4) work in all types of furnaces, (5) work in grinding or breaking glassware, (6) sandblasting, (7) working with hydrofluoric acid of over 30 per cent concentration, (8) painting with glass colors containing lead when they cannot be applied with a brush or rubber stamp. In the heavy clay products and fine ceramics industry, women are forbidden to place the filled saggers in the furnace or to remove the ware after firing. They must not carry the filled saggers or boxes of fired ware weighing over 15 kgm., and may not be employed in fritting. The temperature in shops must not be allowed to fall below 61°F. If a lower temperature is required for technical reasons, the employees must have a room heated to at least 64°F. at their disposal with facilities for heating water. Hours of labor have been increased during the war, and in extreme cases 10 hours daily or 56 hours weekly are permitted. If work periods of 6 to 9 hours without a stop are required, there must be a half-hour rest and at least a 1-hour rest after longer periods of work. Women are paid the same as men for piecework, but when paid by time, it must be considered that cranes have to be installed to lighten the work of women; for this reason they are paid 80 per cent as

much as men. When women work over 9 hours and must be present at their place of work 10 hours daily or if they work nights, they are allowed increased rations. An increase is also allowed to a worker who lives so far away as to necessitate more than 11 hours daily absence from home.

(*Press Reports*)

GREAT BRITAIN

R. A. F. vs. the "Zero" Fighter:

Japan's Mitsubishi Navy "00" fighter which is said to resemble the Focke-Wulf "Fw 190" with inwards retracting undercarriage, has caused a need for higher performance among allied fighters in the Far East. Incidentally, the "00" stands for the date of design, in this instance 1940.

In "The Daily Mail" of March 23, a war correspondent stated that the R. A. F.'s best aeroplanes in the Far East—the Hurricane fighters and Blenheim bombers—have been equal to the best the enemy could put into the air, but there were not enough of them.

Too many of the British machines were inferior in performance to the enemy's. The British have been using Buffaloes and Mohawks, which, though maneuverable and efficient fighters against bombers, are 30 or 40 m.p.h. slower than the best Japanese fighters.

(*The Aeroplane*)

Bomber-Fighter — New Dual-Purpose Plane Used by British:

A new airplane with a dual personality—fighter as well as bomber—has enabled the British to develop a technique of bombing entirely new even among the novelties of modern aerial warfare. In a day when new planes are being equipped with superchargers to cruise in the heights of the stratosphere, this latest air weapon hugs the ground and even dips into hollows or ravines to hide from enemy fire.

INDIA

Political and Religious Factors in the Indian Breakdown.—Self-Governing Provinces and Feudal States:

| British Provinces | 1931 Area In Square Miles | 1931 Total Popula- tion |
|-----------------------|------------------------------------|----------------------------------|
| Ajmer-Merwara | 2,711 | 560,292 |
| Andamans and Nicobars | 3,143 | 29,463 |
| Assam | 67,334 | 9,247,857 |
| Baluchistan | 134,638 | 865,617 |
| Bengal | 82,955 | 51,087,338 |
| Bihar and Orissa | 111,702 | 42,329,583 |
| Bombay Presidency | 151,673 | 26,398,997 |



| | | |
|-----------------------------|-----------|-------------|
| Aden | 80 | 51,478 |
| Burma | 233,492 | 14,667,146 |
| Central Provinces and Berar | 131,095 | 17,990,937 |
| Coorg | 1,593 | 163,327 |
| Delhi | 573 | 636,246 |
| Madras | 143,870 | 47,193,602 |
| N.W. Frontier Province | 36,356 | 4,684,364 |
| Punjab | 105,020 | 24,018,639 |
| United Provinces | 112,191 | 49,614,583 |
| | 1,318,346 | 259,491,241 |

Sir Stafford Cripps, in his broadcast from New Delhi on April 11, frankly re capitulated the reasons for his failure to achieve unity among the various Indian political parties. The real cause of the break-down, he stressed, was that "the temporary form of government envisaged was not such as to enable them to join the Government." The remedy they suggested was, first, an immediate change of Constitution, raised at the last moment and "wholly impracticable while war is proceeding;" and second, to enter a "true national government by a Cabinet of Indian leaders untrammelled by any control by the Viceroy or the British Cabinet." Sir Stafford's comment on this demand was that it would mean "government for an indefinite period by a set of persons responsible to no legislature or electorate, incapable of being changed and the majority of whom would be in a position to dominate large minorities." The great minorities in India would never accept such a system, nor could His Majesty's Government, who have given pledges to those minorities, "consent to their being placed unprotected under possibly inimical rule. It would be a breach of all the pledges we have given." We reproduce the map of India, which shows the self-governing Provinces and those of the Princes, and a table giving areas and population in 1931 (to which 10 per cent should be added).

| | 1931 Feudal States | 1931 Area In Square Miles | 1931 Total Popula- tion |
|-------------------------|-----------------------|------------------------------------|----------------------------------|
| Baroda State | 8,164 | 2,443,007 | |
| Central India | 51,597 | 6,632,790 | |
| Cochin State | 1,480 | 1,205,016 | |
| Gwalior State | 26,367 | 3,523,070 | |
| Hyderabad State | 82,698 | 14,436,148 | |
| Jammu and Kashmir State | 84,516 | 3,646,243 | |
| Mysore State | 29,326 | 6,557,302 | |
| Punjab States | 31,241 | 4,472,218 | |
| Rajputana | 129,059 | 11,225,712 | |
| Sikkim State | 2,818 | 109,808 | |
| Travancore State | 7,625 | 5,098,973 | |
| Western India States | 35,442 | 8,992,250 | |
| Total States | 490,538 | 63,346,537 | |
| Total India | 1,808,679 | 352,837,778 | |

(Illustrated London News)

JAPAN

The Platoon:

In time of peace the platoon includes 4 rifle squads and two light machine-gun

squads. The platoon has two grenade-thrower units.

The platoon has 56 men. Rate of fire per minute:

| | |
|----------------------|-------------------------------|
| 8 Light machine guns | 450 rounds |
| 49 Rifles | 490 rounds |
| 2 Grenade-throwers | 12 grenades |
| Total | 940 rounds and 12 grenades |

(From the book "Combat Action of the Engineer Platoon," by Colonel S. G. Gurov, Russian Army).

Artillery and Tanks:

The artillery is equipped to a very extensive degree with machine guns for close defense. The light regiment of a normal division with a strength of 2,700 men, has 138; the lightest regiment of a light division with 2,600 men, has 72 machine guns. This makes, therefore, one machine gun for every 20 or 37 men, respectively.

Rocket cannon were used by the Japanese in the battle for Singapore for the first time on a large scale. These cannon, constructed by Colonel Kuwata, are characterized by their very light weight. From very simply supported beds, shells are fired by the rocket principle, which, on striking the target, possesses a great explosive effect.

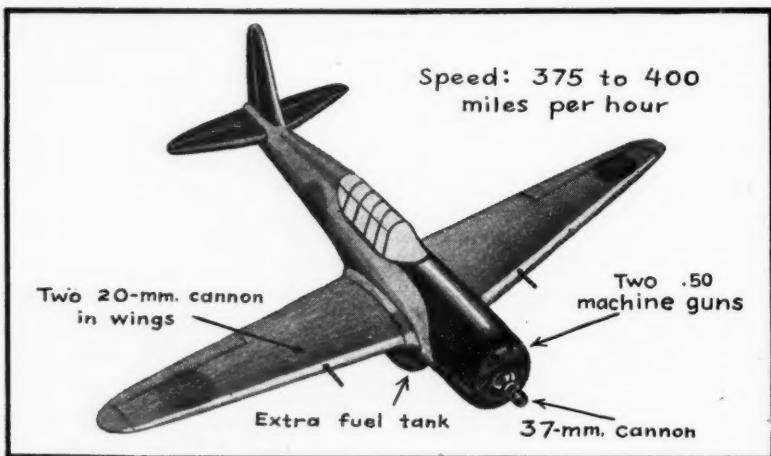
The six-wheeled Japanese scouting tank, the "Sumida," weighs 7 tons, is about 6.5 meters in length, 2.3 meters high, has a machine gun in the rotating turret and other machine guns or machine pistols in the sides. It is driven by the rear wheels. It has a crew of 6 men. After changing the wheels, this tank can be used on railways.

(*Militär-Wochenblatt*)

The Zero Fighter:

The drawing below illustrates for the first time the characteristics of a Japanese Navy Zero fighter plane. The type shown, with 37 and 20-mm cannon plus .50-caliber machine guns, is the most heavily armed of several versions. The armament, in fact, is so powerful that it seems likely that the Japanese have overgunned this plane—as they have many of their warships—to the detriment of other qualities. The machine guns are also curiously placed. Other major powers have abandoned as obsolete such arrangements for firing through the propellers.

Much of the mystery about the formidable Zero, which operates from land bases as well as carriers, stems from the fact that it is made in a number of



Newsweek

MILITARY NOTES AROUND THE WORLD

different versions. The most numerous type appears to carry two 20-mm. cannon and two .28-caliber machine guns. An air-cooled motor produces a speed that ranges from 375 miles an hour in some models to nearly 400 in the latest version. The plane carries a detachable belly gasoline tank which is supposed to give it the extreme range of 1,500 miles.

The Zero was first manufactured in 1940 and derives its name from this circumstance. Japanese aircraft are identified by the last two digits of the year of their introduction, and since 1940 was the year 2600 in the Japanese calendar, the craft was simply called the Zero.

(Courtesy of "Newsweek")

The 105-mm Gun:

The 105-mm gun, Model 30, is a very modern weapon with a barrel of a length of 40 calibers, split trail and gun shield. With a muzzle velocity of about 800 meters (about 2,625 ft.) per second, it fires a projectile weighing 16 kg. (about 35.2 lbs.) a distance of 18,000 meters (about 11.2 miles). When in fire readiness the gun weighs 4,500 kg. (about 9,900 lbs.) and is moved by means of a tractor with caterpillar tread. The wheels of the gun carriage are provided with rubber tires.

(*Militär-Wochenblatt*)

MEXICO

Civil Aviation:

Statistics for civil transport flying in Mexico for the year 1939 show that 85,481 passengers, 597,718 lbs. of mail, 8,255,971 lbs. of freight, and 2,285,877 lbs. of baggage were carried. Only one accident is shown in 352,005 miles flown, and there is not one fatality in 918,911 miles.

At the end of the year there were 260 privately owned aeroplanes and 230 commercial aeroplanes. The number of pilots was approximately 375 private and 500 transport pilots.

(*The Aeroplane*)

SWITZERLAND

The Swiss Antitank Rifle:

The antitank rifle is manufactured by the Solothurn Arms Works, with the model designation of "Solo" (see illustration). It has been recently improved



through the substitution of a longer barrel for the former one and the addition of a muzzle brake. Its penetration, accuracy and weight have been increased.

(*Militär-Wochenblatt*)

SPAIN

Air Training:

Spain's pre-military flying instruction is organized on German lines, stated Lieutenant-Colonel Bono Groves, head of the "Pro-Aviation Campaign." Seven

new flying schools have been set up during recent months. They are capable of training more than 1,000 pupils simultaneously. The training machines are of German design, built in Spain.

(*The Aeroplane*)

UNITED STATES

"Weapon and Transport—Role of the Dirigible in Sea War."—By Admiral William V. Pratt, U. S. N. Retired.

(Reprinted Through the Courtesy of "Newsweek.")

The prospect of a new phase in modern warfare opened up when, in a bill before Congress to authorize 24 more blimps, the nonrigid limitation was stricken out. This would mean, if the committee concerned is upheld, that the Navy is free not only to build the blimp but the larger dirigible as well.

The demand for this increase in lighter-than-air power came because the counter-drive against the submarine, following much the same lines as the patrol system inaugurated by the British in the first part of the last war, has not been progressing too well along the Atlantic Seaboard. It has finally been established that the hovering blimp, carrying depth bombs and good contact devices, is a better antagonist of the submarine than the patrol plant or the fast-flying Army bomber. Hence the demand for the blimp.

But the blimp shows only a small sample of what airships can do. To compare the blimp with the dirigible would

be about the same as comparing a small coastwise ship with a Queen Mary. The range of the blimp is from 850 to 2,500 miles, depending on size, and its carrying capacity is limited. Its approximate top speed is 50 miles an hour. Within its limitations it is most useful, of course; in the last war, craft of this type spotted 49 submarines and bombed 27. But a dirigible of 10,000,000 cubic feet capacity can cruise 10,000 sea miles without refueling, at a cruising speed of 50 miles and a top speed of 85, carrying a heavy load of depth bombs.

And this is not all the large airship can do. As a troop carrier, provided it steers clear of hostile land-based planes, it is probably safer than sea transportation. It is decidedly faster. As a cargo carrier it can fly over the land while sea transport must go many roundabout miles.

Also, the dirigible can carry ten attack bombers, which can be flown off and then retrieved when they hook themselves onto a trapeze mast lowered from the dirigible. It is easier than landing on the deck of a carrier, which is hampered by the pitch and roll induced by heavy seas. And the operation is simple—after the plane hooks on it is hoisted through an aperture, much as an anchor used to be catted and fished. Furthermore, by the use of range lights, the plane can approach the mother ship at night. The hooking-on gear is illuminated so that contact can be completed.

Furthermore, the big airship can carry those planes which cannot make oceanic steppingstones on their own wings straight to their destination. As its capacities develop it should be able to carry

SWEDEN



Armor-Protected Antitank Gun:

These are illustrations of the Swedish self-propelled antitank gun. Illustration No. 1 shows the gun in a firing position for antitank defense. Illustration No. 2 shows it in readiness for antiaircraft defense.

The weapon is mounted in an open turret capable of 360 degrees traverse.

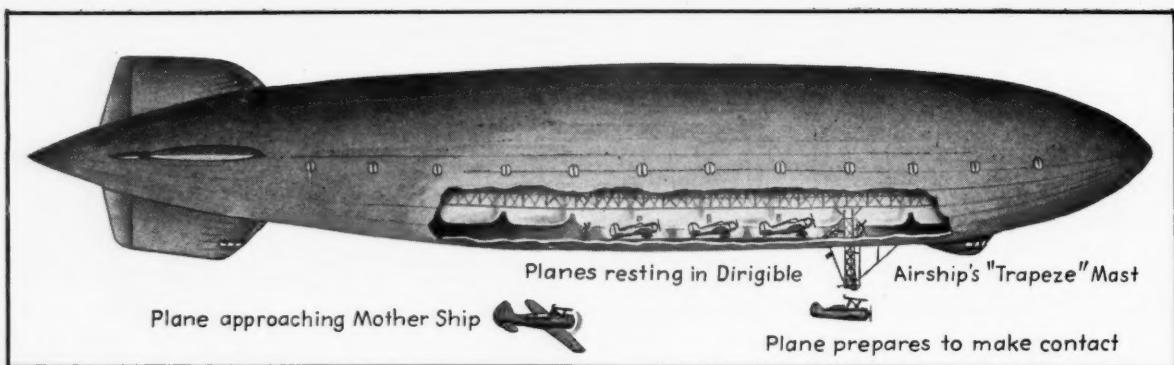
(*Die Panzertruppe*)

Aircraft Production:

The director of the Swedish aircraft factory Aeroplansbolaget, Wahrgren, has stated that Sweden's aircraft industry is now self-sufficient. Swedish works had been reorganized and will produce both aeroplanes and motors, he claimed. The Swedish aircraft industry has 1,100 employees and officials.

(*The Aeroplane*)





Newsweek

THE AIRSHIP AS A PLANE CARRIER: HOW THE DIRIGIBLE CAN BE USED AS A TRANSPORT OR AS AN OFFENSIVE WEAPON.

loads of several tons' weight and, in this way, do something to relieve the bottleneck in sea transportation. In effect it is one part of the air-transport system which is most important, for if sea transportation is to meet the demands set by production, it must call on the air arm to help.

The principal objection to the dirigible has been its vulnerability to air attack—for it is certainly not vulnerable to sea attack except from the aircraft carrier, and a ship of this type must get within air-striking distance of a prey which moves more than twice as fast. Moreover, if attacked, the airship which has its own planes can retaliate on the carrier with bombers, and if both mother craft are lost the carrier foots the bigger bill.

What naval craft is not vulnerable in this modern war? The Prince of Wales went down in an air attack because it had no air protection. And what battleship would care to stand up, unassisted, against a night attack of a hundred hornets of the sea, like those that did such good work in the Philippines? Certainly the dirigible is free from that danger.

Prone Flying—Has Advantages for Military Purposes:

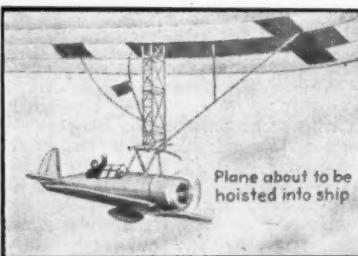
In a recent issue of "The Army and Navy Journal," it is stated that both the United States and Britain as well as Germany have for some time been experimenting with pursuit planes for prone flying. The new Focke-Wulf fighter plane, developed in Germany and still in the experimental stage, is designed so that the pilot and two-man crew all lie prone instead of sitting upright as in conventional ships.

Prone flying, first of all, tends to decrease the cross section of the fuselage and thus provides less drag and more speed. But it has even more value in decreasing the "blackout" often suffered by combat pilots today. In conventional planes, where the pilot sits upright, the centrifugal force developed when coming out of a dive is virtually perpendicular to the pilot's body and the blood drains readily from the pilot's head. In prone flying, the centrifugal force is almost horizontal to the pilot's body. This tends to reduce "blackouts"; consequently the pilot can make tighter pullouts and spirals. In dive bombing this permits delayed pullouts.

(*Scientific American*)

Funnels—Stainless Steel Saves Over Four Tons Per Stack:

Destroyers—often referred to as the "greyhounds" of the battle fleet—are re-



(*Newsweek*)

THE TRAPEZE MAST HOISTS THE PLANE INTO THE INTERIOR OF THE AIRSHIP.

quired to operate on a comparatively low displacement, so that they can readily attain the high speeds essential to their effective use. Every ton of material that goes into the structure of a vessel of this class of warship, consequently, is given careful consideration.

Just recently, for example, it was announced that the United States Navy's newest destroyers will carry stainless-steel funnels. These funnels are said to be 4½ tons lighter than the type used on destroyers built in previous years. This means that additional armor, guns, and torpedoes can be carried.

Even though the sections of metal used in these funnels are relatively thin, the resulting structures are remarkably sturdy because of the high strength of the stainless steel, their welded construction, and the fact that adequate reinforcement is provided by corrugated stiffness. The metal's resistance to the corrosive action of salt air and exhaust fumes, and its resistance to shock, should also provide added safety under stresses to which they will be subjected when placed in naval service.

(*Scientific American*)

Pittsburgh Schools Give Aviation Course:

The Board of Education in Pittsburgh, Pa., has instituted an aviation course in its high schools in which there are now nearly 600 students enrolled. The course is open only to seniors and is included in the regular courses of study. Students who successfully complete the course are given regular credits.

The course covers two full semesters with classes every school day during regular school hours and covers the same subject matter as is covered by Government approved primary ground schools.

The present course is a forerunner to an expanding program for aviation training which, it is anticipated, will soon include vocational training in all branches of aviation.

This is in line with the national effort to "air condition" the youth of America and to prepare them to take their places in a world transformed by air transportation.

Similar courses are already projected for the high schools at Dormont, Mount Lebanon, Bradford, and Johnstown, Pa.

(*Civil Aeronautics Journal*)

Use of Russian Rubber Plant:

Seed of rubber-bearing koksagyz, received by air from the Soviet Union, has been planted experimentally in the northern United States, the Soviet Embassy was informed by Secretary of Agriculture Claude R. Wickard. The Soviet Union gets most of its natural rubber from this plant.

Secretary Wickard expressed appreciation of the efforts of the Soviet Government and Ambassador Litvinov in providing koksagyz seed for planting in the United States and said that test plantings have already been made with seed received in two shipments by air. Larger shipments by sea are now on the way to this country from the Soviet Union.

(*Soviet Embassy Bulletin*)

U. S. S. R.

Russian Artillery:

The 203-mm howitzer (shown on illustration) is transported in two sections. The carriage, in place of the former



customary wheels, is provided with a broad caterpillar track. The tube is transported on a six-wheeled carriage.

MILITARY NOTES AROUND THE WORLD

Both loads are pulled by powerful, caterpillar tractors which also carry the gun crews. Russia's great artillery strength is apparent from the following figures, which, however, includes but a small fraction of the new equipment:

| Weight | Weight of Projectile | Range |
|---|----------------------------|-----------|
| 7.62-cm "cannon-howitzer", —27 | 14.3 lbs. | 4.3 miles |
| 7.62-cm field cannon—36 and 39 | | |
| 7.62-cm field cannon—02/30 | 14.3 lbs. | 8.0 miles |
| 107-mm cannon—10/30 | 36.5 lbs. | 9.9 miles |
| 122-mm light field howitzer 10/30 | 51.0 lbs. | 6.2 miles |
| 122-mm heavy field howitzer 38 | | |
| 122-mm cannon—31 | | |
| 122-mm howitzer—10/30 | 90.2 lbs. | 7.5 miles |
| 152-mm "cannon-howitzer", 37 | | |
| A 7.62-cm cannon—38/39 L 30.5 is used as armament for the medium tank T 34. | | |

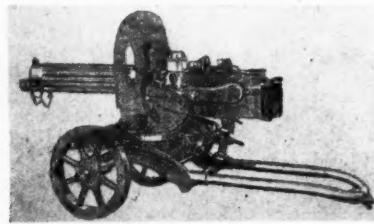
(*Militär-Wochenblatt*)

Machine Guns:

The extra-heavy machine gun, the Degtyarev model on a wheeled mount with gun shield has a barrel whose caliber is 12.7-mm, is air cooled and has a muzzle brake. It is constructed on the principle of a gas-operated gun and has a theoretical rate of fire of 600 rounds per minute. It is belt fed. The horizontal range is 3.5 kilometers; vertical range 1.5 kilometer. It has a good penetration against tanks, at a range of about 990 feet. In fire readiness, the extra-heavy

machine gun weighs 140 kg. (about 308 lbs.).

The Maxim heavy machine gun (see cut) a recoil-operated gun with movable



barrel and gun shield, has likewise a wheeled mount, 500 rounds per minute are fired from a barrel of 7.62-mm caliber. The cartridge belts, each with 250 cartridges, are carried in cases. This water-cooled gun is being replaced by a gas-operated model.

(*Militär-Wochenblatt*)

Infantry Equipment:

The infantry is equipped with light, medium and heavy trench mortars which, according to "Wehrtechnische Monatshefte," are of modern construction. The light 51-mm trench mortar, M-40, is a muzzle loader consisting of tube, bipod, laying mechanism and ground plate with a total weight of 22 kg. (about 48 lbs.).

The traversing mechanism provides for a 30-degree field of fire to both right and left. The shortest range with an elevation of 75 degrees, is about 198 feet; with an elevation of 45 degrees, about 2,640 feet. The mortar's maximum rate of fire is 30 rounds per minute. According to the Russian army manuals, it hurls a 0.9 kg. (about 2 lbs.) spherical trench mortar shell whose sp'inter effect covers an area of about 660 sq. feet. One man carries 7 shells in a carrying case on his back. The medium 120-mm, 38 trench mortar which also consists of tube, bipod, laying apparatus and ground plate, is loaded for the purpose of changing location on a two-wheeled cart provided with rubber tires which is attached to a limber, likewise equipped with rubber tires.

(*Militär-Wochenblatt*)

Artillery Equipment:

Field artillery batteries have two heavy Maxim machine guns, Model 1910, which are transported on horse-drawn vehicles. The 122-mm howitzer, M-10, and the machine guns are assigned to the battery. Ready for firing, the L-13 howitzer weighs 1300 kg. (about 2,860 lbs.) and with a 23 kg. (about 50.6 lbs.) shell, has a range of 7,700 meters (8,393 yds.). The heavy machine gun without shield assigned to the batteries, weighs some 50 kg. (about 110 lbs.) and has a fire rate of 500 rounds per minute.

(*Militär-Wochenblatt*)

The Second World War

[This survey covers reports up to 10 September 1942.]

The War in Europe

The Russian Front.—At the beginning of June, 1942, the Allied world regarded the situation on the Russian front with high hopes. Hitler's long-promised spring offensive had never been launched, and while a summer offensive was accepted as inevitable, there was reason to believe that it would not succeed. Kerch, in the Crimean peninsula, had indeed fallen late in May, but Sevastopol still held firmly, and at many points along the vast front the Russians continued to maintain offensive action, pounding away at the German "winter line" without respite. Then also, the ravages of winter were believed to have taken a terrible toll of Nazi power, while the Russians' continued initiative boded well for the condition of their forces as summer approached.

Nothing decisive, however, was achieved by the many Russian thrusts at the Nazi lines. Both sides claimed

successes in local actions at various points on the long front, but the first event of real significance was the beginning of a major German attack upon Sevastopol in the first week of June. Before the end of the month it was evident that the city was doomed, although it was not until July 3 that the Russians announced its evacuation. The Crimea was thus left entirely in German hands.

The worst of the news, however, during those last weeks of June, was not that Sevastopol was doomed, but that all along the battle line, wherever Russians and Germans clashed, the Germans consistently revealed their superiority. It was becoming only too evident that it was the Russian and not the German army that had suffered more seriously through the hardships of the long winter. Everywhere that the Germans attacked or counterattacked they exhibited a preponderance of power in men, planes, and tanks, and their

fighting spirit was apparently at the peak.

At the end of June, with Sevastopol on the verge of collapse, the Germans began their long-expected major offensive. Local battles in the Kharkov sector rapidly took on the aspects of a larger effort, and the same was true in the Kursk sector, 125 miles to the north. These offensives soon widened and joined in one great drive into Russia, the whole southern front becoming a single battle of many sectors.

By the middle of July the Germans had pushed through the Russian defenses and had reached the Don river at Voronezh east of Kursk, occupying the west bank of the river as far south as Boguchar east of Kharkov. They had cut the Rostov-Moscow railway which supplied the whole of Russia's southern front with the oil and other products of the rich lands between the Don and the Caucasus. They now had nearly the whole Ukraine behind them, and had cut



THE SECOND WORLD WAR

dangerously between the defenders of Moscow and the armies of southern Russia, while their eastern front had been carried 150 miles beyond their farthest advance of the previous summer. During the third week of July Hitler's massive drive swung southeastward toward the lower reaches of the Don, flanking Rostov from the north and northeast.

Attacked from three sides, Rostov fell to the Germans within a month after the great offensive began. The loss of this city with its shipyards, oil pipe-lines, and industries was a bitter blow to the Russians, but apparently they still hoped to hold the southern bank of the Don against further advances toward the oil of the Caucasus. This hope was shattered almost immediately, for the Germans quickly established bridgeheads 120 miles east of the city near Tsimlyansk and were soon in possession of Bataisk, twenty miles south of the Don below Rostov. Within another week the Nazis had overrun practically the whole area within the great bend of the Don as far as the line from Kletskaya to Kalach where the Russians stopped them in one of the great tank and air battles of history. For more than two weeks the battle of the Don bend raged on, until the whole area was a wreck-heap of shattered tanks and planes, but still Kletskaya held. Finally the Germans bypassed the city to the south, forcing their way to the Don northwest and west of Stalingrad, and it was then only a matter of a few days, late in August, until they crossed the river in force and were in a position to attack Stalingrad directly.

Meanwhile, south of the Don the invaders were fanning out in several directions. First, they cut the main railway of the region, the Krasnodar-Stalingrad line, at Salsk, and then they fought their way along this line to approach Stalingrad from the southwest. Here they seem to have met some of the most effective Russian resistance of the summer's campaign, especially in the Kotelnikovo area. In the last week of August, however, the Germans were virtually on the outskirts of Stalingrad both to the northwest and to the southwest. With the mighty pincers closing in upon them the Russians were forced to put up one of those ferocious last-ditch stands for which they have become famous. Stalingrad stands on the western bank of the Volga facing the river with little natural defense against attack from the west where the terrain is well suited for the operations of mechanized forces. Nevertheless, in spite of a great German advantage in tanks and planes, with their city burning behind them under wave after wave of dive-bombers the Russians held back the Nazi masses, and day after day the apparently doomed city refused to capitulate.

South of the Don the German advance continued rapidly. A huge wedge, based to the north on Rostov and Tsimlyansk, was driven southward, first to Salsk and then step by step to the foothills of the Caucasus. In mid-August, the Russians admitted that the Maikop oil region, producing 7% of Russia's annual output, was in German control. By this time, too, long arms had been thrown out from the main wedge toward the Caspian and the Black Seas. Town after town along the northern foothills of the Caucasus fell to the invaders, until by the end of the month their eastward advance had carried them as far as Mzodok, only sixty miles from the oil fields of Grozny. The Germans also claimed that, in some undisclosed way, they had

taken Elista far to the east of their main area of occupation, and later they reported the seizure of the village of Lineinaye, only forty miles southwest of Astrakhan near the mouth of the Volga.

To the westward, by the end of August, the coast of the Black Sea was in German hands as far south as the naval base at Novorossisk, the capture of which was claimed by Berlin on September 6. Toward the smaller naval base at Tuapse too, German tentacles were reaching out. Finally, from the 300-mile line of occupation along the foothills of the Caucasus, German Alpine troops were reported to be fighting their way into the passes of the great mountains, and a detachment was said to have planted the swastika on Mt. Elbrus, the highest peak in Europe.

By comparison with the vast successes of the Nazis in the south, the continued thrusts of the Russians at Voronezh, Rzhev, and other points along the northern front, appeared feeble indeed. Minor successes were reported, but at no point was the Russian strength sufficient to win more than a limited and indecisive victory. Furthermore, the offensives maintained by the Russians up on the line north of Voronezh apparently failed to make necessary any movement of German reinforcements sufficient to relieve the pressure on the Russian armies in the south.

Western Europe.—During the summer, Allied activity against Germany in western Europe was limited to air attacks and Commando raids. Probably no air raid in this period equalled in magnitude the great 1,250-plane raid of May 30 on Cologne, but there were several in which as many as 600 planes participated. While Hamburg, Bremen, and the great industrial cities of the valleys of the Rhine and the Ruhr were hit hardest, the R. A. F. ranged widely over Germany and the occupied countries, reaching out as far as Danzig and the Polish port of Gdynia. In August, American planes began to participate in the raids with increasing effect. During the three days of August 11-13 alone, American planes took part in 31 operations over the Channel and the French coast. On August 17, twelve "flying fortresses," protected by British fighters, conducted the first all-American bombing raid. These planes specialized in daylight precision bombing over the coasts adjacent to the British Isles, and it was only on their tenth expedition that the big American planes suffered a loss when, on September 7, two of their number failed to return from a raid over northern France.

On August 19 the greatest of all Commando expeditions succeeded in remaining on the French coast in and around Dieppe for nine hours. The raiders, said to have numbered about 6,000, were reported to have destroyed important military installations and to have obtained valuable information concerning the German coastal defense system.

A Second Front?—Talk of a second front to be opened in western Europe continued throughout the summer. In mid-June, V. M. Molotov, the Russian Commissar for Foreign Affairs, flew to London and Washington for secret conversations, and it was reported that, among other results of his visits, Molotov went home with an Anglo-American agreement concerning what the State Department in Washington referred to as "the urgent tasks of creating a second front in Europe in 1942." Shortly following the Molotov visit, Prime Minister Churchill also arrived in Washington for secret talks, and a joint statement issued

by Churchill and President Roosevelt on June 25 stated that "the coming operations which were discussed in detail . . . will divert German strength from the attack on Russia." On August 12, Churchill arrived by air in Moscow with a party of twenty, including six Americans, and their conversations with Stalin were confidently believed to have resulted in an agreement for a new front. Nevertheless, no second front appeared in western Europe, and when September arrived, hopes for such a development in 1942 were definitely on the wane.

All this talk, together with obvious preparations for action in the west, seem to have caused considerable apprehension in Germany. Workers were rushed from central Europe for work on coastal defenses; hostages were rounded up in occupied countries to be shot if their countrymen aided invaders; the Norwegian coast was on the alert after August 1 and civilian evacuation on short notice was arranged for; and a Turkish source reported that from 150,000 to 180,000 Axis troops intended for Egypt were being held in Greece for use in case a second front was opened.

Unrest and Resistance.—In many parts of occupied Europe unrest was evident, but seldom was it possible for the people to express resentment in the form of effective action. Only in Yugoslavia did any direct action on a large scale succeed in producing results. There, General Draja Mihailovich with a force estimated to number 200,000 continued to keep Axis troops busy in the former Serbia and Montenegro and in parts of Croatia. These Yugoslav guerrillas were reported to have driven Italian troops from most of the former province of Bosnia, and in the district of Zagreb, capital of Croatia, a state of siege was declared.

Trouble continued in Norway, especially over Nazi policy toward the Church, but elsewhere in the west little was heard from the people except for stories of occasional murders of Nazis and rumors of sabotage or slow-ups in the factories.

In Spain, the pro-Axis foreign minister, Ramon Serrano Suñer, was replaced on September 3 by General Francisco Gomez Jordana, regarded as more sympathetic toward the Allies. This was at first believed to reflect discontent with the government's pro-Axis tendencies, but was later interpreted as merely a shift of power within the Falange party. Its full significance, however, remained unclear.

The War in North Africa and the Mediterranean

Libya and Egypt.—From February until late in May there was very little action in North Africa. Then suddenly on the evening of May 26, General Rommel launched his Axis forces around the Allies' southern flank at Bir Hacheim, intending apparently to sweep northward to Tobruk, fifty miles away. The attempt failed, and on June 2 Prime Minister Churchill announced confidently that Rommel's plans had "gone completely awry" with a large part of his armored force destroyed. However, after a brief pause for reorganization, Rommel renewed his attack and on June 11 he took Bir Hacheim and, swinging quickly northward, he cut the coastal highway between El Gazala and Tobruk. British forces, isolated by this movement, extricated themselves with diffi-

MILITARY REVIEW

culty. In the struggle that followed, the British Eighth Army split, one part remaining to defend Tobruk and the other falling back to the east.

Three weeks after the drive began, Rommel was in a position to launch an all-out attack on Tobruk, and on June 21 he took the town, claiming the capture of 25,000 British prisoners and quantities of supplies. Then with the aid of captured British and American tanks, the Axis forces dashed headlong for Egypt. They crossed the border, passing Solum and Halfaya where they had been stopped the preceding summer, and advanced 200 miles across the Egyptian desert. On June 30, the Berlin radio announced that the British Eighth Army was utterly defeated. On July 2, Axis reports stated that "the avalanche into Egypt continues" and "El Alamein has long been passed," while Alexandria was expected to fall within a day or two. The Rome radio said on July 3: "The victorious march of the Italian and German detachments cannot now be arrested." This, however, was not true, and Rommel in fact never passed El Alamein.

On June 25, Lieut. Gen. Neil Ritchie was replaced by General Sir Claude Auchinleck as commander of the Allied forces, and Auchinleck decided to make a determined stand in the bottle-neck between El Alamein on the coast and the supposedly impassable Qattara depression forty miles to the south. Here, about seventy miles from Alexandria, he drew up the remnants of the Eighth Army, reinforced now by a rapid movement of troops from Palestine, Syria, Iraq, and Iran. Rommel threw his victorious army against the Allied line, but there was a limit to the endurance even of a Nazi. In eleven days his men had advanced 325 miles across the desert and apparently they had reached the point where rest and recuperation were absolutely essential. Unable to break Auchinleck's resistance, Rommel settled down to face the Allies and await reinforcements.

Mediterranean. All through these weeks ground actions were limited to occasional artillery duels and skirmishes between patrols. American planes, tanks, and men arrived in considerable numbers, and American and British bombers pounded unceasingly at Axis convoys in the Mediterranean and at ports on both the northern and the southern shores. Axis troop concentrations and supply dumps behind the lines were raided over and over again, but in spite of the heavy losses he suffered, Rommel was admittedly adding steadily to his strength in men and supplies.

When the worst of the summer's heat began to give way to cooler weather, the renewal of the struggle was regarded as inevitable, with both sides rested and strongly reinforced. Churchill's visit to the Egyptian front in mid-August emphasized the importance of the impending campaign which might determine the fate not only of Egypt but of the whole Near East as well. The visit was followed by the removal of Auchinleck from command and his replacement by General Sir Harold Alexander.

After almost two months of relative quiet on the ground front and of constant activity in the air and along the supply routes, the major conflict was suddenly reopened early on the morning of August 31 when Rommel threw his armored forces against the southern wing of the Allied line and dashed eight miles into the Allied mine-fields. He never succeeded, however, in penetrating General Alexander's organized defense area and lighter attacks by Italians farther to the north were quickly thrown back. Allied planes heavily bombarded German supply columns and troop concentrations in the rear of the lines, and Allied tanks, including American-manned General Grants, struck at Rommel's advance lines with good effect. On September 3 the Germans withdrew slightly, and their later attempts to recover the lost positions did not succeed. Further withdrawals followed until, by September 7, the forces of the

The Mediterranean—Action in the Mediterranean during the past quarter very largely consisted of attacks on convoys—Allied convoys heading for Malta and Axis convoys striving to reinforce General Rommel in Egypt. Accounts of these engagements are vague and the claims of the opponents show wide differences. Allied bombers repeatedly attacked Axis-held ports from which Rommel was drawing supplies, including Pylos (Navarino) in Greece, Candia and Suda Bay in Crete, Taranto in Italy, and Cagliari in Sardinia. Malta was frequently attacked by Axis bombers, but the island continued to function in the service of the Allies.

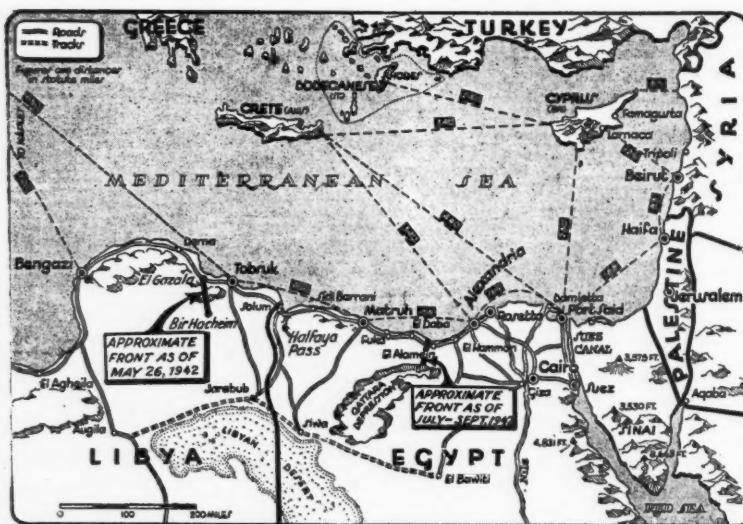
The War in the Pacific Islands

The Aleutians, Wake, and Makin.—Among the islands of the Pacific, action was widespread during the summer months. American opinion was deeply stirred when early in June the Japanese, under cover of bad weather and heavy fog, succeeded in occupying the islands of Attu and Kiska in the western Aleutians. In the following weeks our naval and air forces delivered several heavy blows, sinking or damaging a number of ships and hitting hard at land installations. Apparently no attempt was made, however, to drive the Japanese completely from the islands.

On June 27, United States Army bombers delivered a devastating attack on Wake Island. Claiming to have leveled everything on the surface of the island, they returned to their base without the loss of a plane. On August 17, an American naval force landed Marines on Makin Island, northernmost of the Gilbert group. Here they were successful in destroying Japanese seaplane installations, after which they quickly withdrew.

The Solomons.—By far the most important American effort of the summer in the Pacific area was the attack on the Solomon Islands. Hitherto, American action in this area had been primarily defensive in character, but now for the first time our forces assumed the offensive and set out to drive the Japs from one of their most dangerous outposts. The attack began on August 7, and the Japanese were apparently taken completely by surprise. Eighteen of their seaplanes were destroyed before they could get into action, but the Japs quickly recovered and put up a vigorous resistance when American Marines began landing operations. By the end of the second day Japanese naval units had reached the battle zone and on the night of August 8-9 they closed in for an attack. Attempting to approach the American transports and cargo ships at the landing points, the Japanese cruisers and destroyers were intercepted by our warships and were forced to retire without reaching their objective. The Marines, meanwhile, succeeded in maintaining and expanding their land positions until they had established effective control of Tulagi, Guadalcanal, Florida, and several smaller islands in the southeastern Solomons. Scattered Japanese detachments still remain in the islands, however, and skirmishing in the jungles may be expected to continue for a long time.

A Japanese fleet of considerable strength advancing toward the American positions in the islands was intercepted on August 23 by carrier-based United



During July and August the struggle centered in the effort to bring up supplies on both sides, and at the same time each side strove to prevent supplies reaching the opposing forces. In this struggle the Allies had the advantage of superior strength in the air, but their supply line around South Africa was vastly longer than Rommel's across the

Axis were apparently back just about where they had been when the drive started except for certain elevations at the southern end of the line, which they seem to have retained. Three days later, September 10, reports indicated that Rommel was bringing up strong reinforcements and a decisive battle was expected to begin at any time.

THE SECOND WORLD WAR

States Navy planes. First reports indicated that a major naval engagement was in prospect or already under way, but later statements from Washington described it merely as a "reconnaissance in force," the Japanese having apparently withdrawn without engaging our fleet.

extends for 4,000 miles between the island-continent and the equator. At the same time, the Japanese made considerable progress in expanding and strengthening their positions in this island chain. An important move was made in July when they occupied the Buna-Gona area on the northern coast of New Guinea.

around New Guinea to the southeast and approach the southern coast by sea. On August 26 a well-equipped Japanese force entered Milne Bay at the extreme eastern tip of the island and began landing operations, quite unaware that the Australians had foreseen the move and had established a strong position in the area. The Japanese walked directly into the trap, and their landing parties took a bad beating from the Australians in the jungles, while their naval force underwent a heavy bombardment from the air which resulted in the loss of several of their ships. Most of those who landed were evacuated by their own warships on the night of August 29. They were forced, however, to leave considerable heavy equipment, including tanks, on the beaches, and scattered Japanese detachments still remained in the jungles. An effort was made to extricate these detachments by Japanese naval vessels on the nights of September 6 and 7, but Allied reports the following day stated that the vessels had been hit hard from the air and that practically all the Japanese who had remained in the jungles had been destroyed.

Foiled at Milne Bay, the Japanese once more turned to the overland route to Port Moresby and on September 8 it was reported that a strong force was advancing from Kokoda. Employing their well-known infiltration and out-flanking tactics, they fought their way through sixteen miles of the most difficult mountain terrain. By September 10 they had passed through the worst of the mountain area and were within forty-four miles of Port Moresby, with Australian patrols and Allied planes struggling desperately to stop their advance. Port Moresby was said to be well prepared to withstand attack, and the Japanese were expected to have great difficulty in transporting sufficient supplies over the mountain trails to sustain their drive.

The War in Asia

China.—In May the Japanese began a campaign for the conquest of east-central China between Shanghai and Canton. They had previously held almost the whole Yangtze river valley from



MILITARY REVIEW

Shanghai to Ichang, and they now began to push southward from strategic points in the occupied area. The aims of the campaign apparently were: first, the conquest of all that part of China which might be used for bombing raids upon Japan and upon Japanese sea lanes to Indo-China and Malaya; second, the

Wenchow on the coast to the southeast. Hardly had this height of success been reached than the Chinese broke the Japanese grip on the Hangchow-Nanchang railway near Hengfeng, and opened a narrow gap in the line which greatly reduced the usefulness of the road for Japanese purposes. Once more the Japs

within range of their objectives. American planes also cooperated with Chinese ground forces which not only prevented further Japanese advances but steadily widened the gap in the Hangchow-Nanchang railway and continuously harried the Japs along the fringes of the occupied areas.

By mid-August the Japanese were doing little more than maintaining positions already held. During the third week of August, however, it became apparent that a change had taken place in Japanese plans. They began to retreat all along the line, even from points that apparently could have been held indefinitely. By the end of the month the port of Wenchow was back in Chinese hands, and in the country to the northwest of Wenchow the Japs abandoned or were driven out of town after town. Lishui with its important airport fell to the Chinese after violent fighting, and the invading army fell back upon Kinhwa on the railway. Meanwhile, in the western sector, Linchwan was recovered and from there the Japanese moved steadily northward, relentlessly pursued by the Chinese. In the first week of September, the Chinese were fighting on the outskirts of Nanchang to the west and Kinhwa to the east, while between these points, 350 miles of the 450-mile Hangchow-Nanchang railway were within their control. Furthermore, they had reoccupied several important air bases from which Japan itself could be bombed. To the south another Chinese drive had reached the outskirts of Canton. Thus, in early September the Japanese had lost or given up nearly all the territory conquered in their great summer offensive, and the original aims of that offensive were obviously unattainable.

Just what caused the Japanese to abandon so much that apparently they might have retained is still a mystery at this time (September 10), but it seems evident that a new campaign is about to be undertaken, and forces are being withdrawn from what had proven a sterile effort for some use that may prove more fruitful.

India.—Although Sir Stafford Cripps failed in his mission to India last spring, the British Government nevertheless admitted Indians to an increased participation in the conduct of the war this summer. The post of Defense Minister for India was given to an Indian for the first time, another Indian became Labor Minister, and two Indians were chosen to sit in Churchill's war cabinet in full parity with Dominion representatives. However, all this gave no satisfaction to the All-India Congress Party whose working committee of 360 met in Bombay on August 7 and, under the influence of Gandhi, voted overwhelmingly for a civil disobedience campaign to break British power in India. The government acted firmly at once, arresting Gandhi and the Congress leaders and using forceful means to quell disturbances. Sporadic riots occurred in various parts of the country but soon collapsed under the guns of the police, most of the country showing no active interest in the movement. Later in the month, the working committee of the All-India Moslem League issued a statement protesting against British appeasement of the Congress party and demanding a separate state (Pakistan) for Moslems. Thus the Indian situation remained, as ever, confused and uneasy, although there appeared to be little serious interference with the existing war effort. The increasing numbers of American troops in



linking up of various railway systems to provide a 3,800-mile all-rail inland route from Shanghai to Singapore, which would require the building of only about 600 miles of new road, and which would greatly relieve the strain upon Japanese shipping; and third, the final destruction of Chinese resistance and the ending of the war in China.

The first requirement for the success of this ambitious plan was the conquest of the railway from Hangchow southwest of Shanghai to Nanchang south of Kiukiang. To accomplish this conquest the Japanese launched drives westward from Hangchow and eastward from Nanchang along the line of the railway. The Chinese resisted fiercely, but for a time it appeared that the Japanese would achieve most of their aims before the end of the summer. One railway town after another fell to the invaders, and their armies extended their control well to the south of the rail line. Toward the end of June the Japs announced that the conquest of the Hangchow-Nanchang railway was complete, and the next step seemed to be an advance along a connecting line to Hengyang and Changsha, through which cities a north-south line extends from the Yangtze river to the great port of Canton.

Meanwhile, the Japs had advanced as far as Linchwan to the southwest and

had to rely upon the round-about Yangtze river route to get supplies and reinforcements to their western fronts, and never again did they succeed in closing the gap in the railway.

The Chinese were greatly encouraged during the summer by the arrival of a small American air force. The A. V. G. (American Volunteer Group), organized and trained by Brig. Gen. Claire L. Chennault, had done wonders with seldom more than fifty available planes, but on July 4 this organization was officially merged with the U. S. Army Air Force. Only a few of the A. V. G. pilots accepted the change and many of them went home, but their great work has been splendidly carried on by the Army airmen. American promises had led the Chinese to expect a force much larger than that which they received, and they had laboriously prepared extensive air fields which still remain idle. In spite of their small number, the American flyers performed brilliantly and Japanese air attacks rapidly ceased to be effective although the American planes were sometimes outnumbered ten to one in the fighting. Attempts to bomb the American air base at Hengyang failed with heavy losses for the Japanese, and with the aid of an excellent Chinese reconnaissance system, the Americans were able to stop Japanese raiders before they could get

THE SECOND WORLD WAR

India were definitely instructed to avoid any participation in the internal difficulties of the country.

Burma.—The Japanese in Burma were unable to engage in military action during the summer on account of the heavy rains of the monsoon season. In spite of the rains, however, American and British planes bombed Japanese air fields and installations, damaged bridges, and attacked troop concentrations. Japanese action against India was anticipated at the end of the rainy season.

Madagascar

Early in May the British seized the strategic naval base at Diego Suarez near the northern tip of Madagascar. After this event the great French island off the southeastern coast of Africa was hardly mentioned in the news until September 10, when the French government in Vichy suddenly announced that strong British land, sea, and air forces were attacking several key points along 675 miles of Madagascar's northwestern coast. According to Vichy, Free French forces had been beaten off near Majunga, 225 miles southwest of Diego Suarez, on September 8, but two days later the British succeeded in landing near by, and at last reports were rapidly advancing inland in the direction of the capital city, Tananarive, about 200 miles from the landing point. This effort was apparently intended to complete the conquest of the whole island in order to prevent the use of its ports by Axis submarines

operating along the vital Allied shipping route to Egypt, the Near East, and Russia.

The Western Hemisphere

The Battle of the Atlantic.—Lack of sufficient shipping facilities continued to be a factor of vital importance in Allied strategy throughout the summer. In June it still appeared that the Axis could sink ships faster than the Allies could build them. The loss of ships during the week of July 12 was reported to be the greatest since the United States entered the war, but the weeks that followed showed a substantial improvement both in the prevention of losses and in the construction of new ships. The convoy system used along the North American coast was given credit for much of the increase in security enjoyed by Allied shipping in that area, and Axis submarines tended more and more to devote their attention to waters farther south. In June, 109 ships were sunk; in July, the number fell to 45; but in August, to the 31st of the month, only 23 ships were reported lost. Meanwhile, American shipyards delivered 71 new cargo ships and large tankers (790,300 deadweight tons) in July and 68 (753,600 deadweight tons) in August. It appeared that the battle of the Atlantic was developing favorably for the Allies.

Latin America.—Brazil, aroused by Axis attacks on her vessels, declared war on Germany and Italy on August 22, and rapidly thereafter she introduced measures to increase her contributions to the Allied cause to the maximum of her

ability. Her geographical position, within 1,620 miles of the African coast, adds greatly to Brazil's value as an ally. The other two great powers of South America, Argentina and Chile, continued to maintain their neutrality. In Argentina, President Roberto Ortiz, supporter of solidarity among democratic nations, was forced to resign his office in June on account of ill health, and on July 15 he died. His place was taken by Ramon Castillo, an isolationist whose sympathies are believed to be strongly pro-Axis. In Chile, however, popular favor seems to be increasing for the Allied cause, and a visit to Washington by the Chilean President is expected in October.

The War Effort in the United States.

—At the end of August more than 500,000 American fighting men were in service outside the United States, according to Assistant Secretary of War J. J. McCloy, and the American contribution in men, munitions, and ships was steadily increasing. Nevertheless, it was not enough. The Office of War Information stated that in June the output of tanks, planes, naval vessels, and most types of artillery fell behind expectations, while the number of small vessels for the anti-submarine campaign was below half the number scheduled. Donald M. Nelson, Chairman of the War Production Board, reported that the production of munitions increased 16% in July, but progress was uneven and the output was 7% less than expected at the beginning of the month. Using war production in November, 1941, as a base (100), the July production index was 350. Figures for August have not yet been issued.

BOOK REVIEWS

LECTURES ON WAR NEUROSES

By T. A. Ross, M.D., F.R.C.P.

116 Pages . . . The Williams & Wilkins Co., Baltimore.

This book consists of reprints of lectures given by the author in the course of his work in England. Dealing as these lectures do, with the commotional and emotional shocks, and with other forms of nervous disturbances which are so common during war, the book containing these learned discourses represents an important contribution to military medicine. The author states in his preface that the original purpose of his lectures was to help battalion medical officers and general practitioners to deal with patients under war strain.

WAR HAS SEVEN FACES

By Frank Gervasi

296 Pages . . . Doubleday, Doran & Co., Garden City, N.Y.

"We'll win the war, all right"—the reassuring opening sentence in the final chapter of Mr. Gervasi's absorbingly interesting book, discloses the whole purpose of this noted correspondent's latest work. Win the war we will because of our superior industrial capacity and manpower, technological skill, and because we have on our side the overwhelming majority of the world's population.

In his quest for the answer to the question of who will emerge the winner from the present struggle the author embarks upon a round-the-globe journey and visited all of the major fighting fronts, except Russia. The impressions he gathered in England, South Africa, Egypt, Libya, and Asia, and his seasoned observations are those of a thoughtful student of world affairs.

As such they merit careful consideration.

AMERICA ORGANIZES TO WIN THE WAR

A handbook on the American War Effort.

395 Pages . . . Harcourt, Brace & Co., New York.

This book is a compendium of articles by a score of noted persons, covering every phase of the American war effort. Such statesmen as President Roosevelt, Vice-President Wallace, Secretary of Agriculture Wickard, join with men of learning and science in discussing a variety of subjects. These include articles on the organization of our Army, Navy and the industrial machine, the contribution of the farmer and the laborer to the national effort, financing the war, and organization for psychological warfare and for the maintenance of morale at home, and on many other equally interesting subjects.

The work lends itself ideally for instructional purposes.

GET TOUGH

By Captain W. E. Fairbairn

121 Pages . . . D. Appleton-Century Co., New York.

We are engaged in a war of unprecedented cruelty and ferocity, and in order to meet our enemies on better than equal terms we must be stronger and more clever physically than they. This is the "leit-motif" of Captain Fairbairn's engaging book which expounds his method of effective hand-to-hand combat.

Captain Fairbairn, a British officer who has taught his bag of tricks to Commandos and Paratroops, is now in this country, on loan from the British Army, teaching close-combat to instructors of the U. S. Armed Forces. His system is now standard for the British.

The book is richly illustrated.

THE AIR RAID WARDEN IN AMERICA

By Jordan W. Lambert

57 Pages . . . Hastings House, New York.

This is a very comprehensive manual covering the duties of the air warden compiled by the author who himself is the Chief Air Raid Warden at Stamford, Connecticut. It outlines the varied duties of these sentinels of public safety during a hostile air attack.

Of particular interest are chapters on personal and group safety, the chemistry of fire extinguishing, facts on the various poison gases and poison smoke, decontamination practices, air warden operations, etc.

This book should be most useful to both civilian and military authorities concerned with protection against attack from the air.

RUSSIA AND JAPAN

By Maurice Hindus

254 Pages . . . Doubleday, Doran & Co., Garden City, N.Y.

Maurice Hindus, the Russian-born American writer and lecturer, has watched Russia grow from a feeble weakling of a country, torn by revolution, civil war and famine, into a powerful industrial and military state. When Mr. Hindus' first writings appeared more than a decade ago, few people in this country were inclined to agree with the author that the Soviet Five-Year Plans of industrial development of U.S.S.R. were something more than just idle pipe-dreams of impractical doctrinaires. However, Russia's valiant stand in the present world-struggle has justified many of the predictions which Mr. Hindus advanced in the late twenties.

To gather material for "Russia and Japan" Mr. Hindus made an extensive tour of Siberia and the Soviet maritime provinces. There he gathered the distinct impression that Russia is fully cognizant of the dangers inherent in Japanese ex-

pansionist ambitions. For many years the U.S.S.R. has been building and preparing for the imminent war against Japan. As a result, the Soviet Union has created in Siberia a great industrial empire capable of sustaining a major effort, such as the war against Japan will entail.

The author is convinced of the inevitability of such a conflict and of Russia's ability to pursue it to a successful conclusion.

STRATEGY FOR VICTORY

By Hanson W. Baldwin

172 Pages . . . W. W. Norton and Company, New York.

Of the numerous so-called "military experts," to whom the lay reading public looks for interpretation of news of the war, Hanson W. Baldwin, author of "Strategy for Victory," is among the better known. As military commentator of the "New York Times" Mr. Baldwin has gained a nationwide reputation for his factual, interesting and readable analyses of the war.

"Strategy for Victory" undertakes to outline the position of America in a world at war. It clearly perceives the implications of the total struggle in which our country is engaged. It presents a vivid picture of the requirements not alone of the fighting front, but of the home front, as well.

The book offers carefully considered thoughts on the employment of our land, sea and air power, along with economic and political pressures and the ultra-modern weapon of psychological warfare.

MEN ON BATAAN

By John Hersey

313 Pages . . . Alfred A. Knopf, New York.

Amidst the plethora of printed matter on General Douglas MacArthur, "Men on Bataan" undoubtedly deserves one of the places of honor. Engagingly written in a unique style, it is more reminiscent of a novel than of the conventional biography.

The magnetic personality of General MacArthur lends itself ideally to the pen, especially a pen as capable as Mr. Hersey's, whose book makes delightful reading.

Among the most interesting chapters are those on General MacArthur's activities as Chief of Staff, his work for the Philippine Army, his soul gripping stand on Bataan and trip to Australia.

NAPOLEON'S INVASION OF RUSSIA

By Eugene Tarlé

422 Pages . . . Oxford University Press, New York.

When the distinguished Soviet historian, Eugene Tarlé, made available in

BOOK REVIEWS

1942 to the English speaking readers his great work which was first published in Russia in 1937, he filled a gap which had singularly existed in historical annals. For, outside of Tolstoy's novel "War and Peace" it was not until the appearance of Tarlé's book that students of military history had available a good Russian record of the ill-fated Napoleonic venture of 1812.

In his research, the author, whose book received the widest acclaim in the United States and Great Britain, did not limit himself, like so many historians, to the existing French accounts of that campaign.

With the cooperation of the Soviet Government—and apparently with an almost psychic prescience of things to pass in 1941—he delved into a wealth of Russian documents on that campaign. The result is a stirring account of the fall of a great conqueror in which the most significant feature is the striking parallel between the controlling factors of both the Napoleonic and Hitlerian ventures. In spite of all the tactical and mechanical changes in warfare one great factor in Russia remains unchanged. In 1942, as in 1812, the indomitable spirit and patriotism of the Russian people, which express themselves into bloody, merciless guerrilla warfare, are again playing the dominant part.

Of particular interest are the characterizations of Russian leaders—the Emperor Alexander, Marshal Kutuzov, Generals Barclay de Tolly, Bagration, Bennigsen, and scores of others.

and leadership as well as to the quality of the Russian soldier and the patriotism and fortitude of the people.

So-called military "experts" and "commentators" of our newspapers and magazines who for years have deprecated the worth of the Red Army, are taken severely to task by the author.

ACTION ON ALL FRONTS

BY RALPH INGERSOLL

330 Pages . . . Harper & Brothers, New York.

Mr. Ingersoll, editor of the New York newspaper PM, is one of the select company of American journalists to visit the Soviet Union under war conditions. The record of his trip to Russia, written in characteristically lively style, as well as his impressions of Far and Near East fighting fronts which he also visited, form an extremely interesting document.

While the author's personal interview with Joseph Stalin was inconclusive from the reader's viewpoint, for Mr. Ingersoll limits himself to general impressions of the Soviet leader, without disclosing the substance of the conversation, the other chapters on Russia—her army—her society—the life of the foreigner in that country, as well as the account of his visit to the other fighting fronts, are very illuminating.

AUSTRALIA

BY GRIFFITH TAYLOR, D.Sc.

455 Pages . . . E. P. Dutton & Co., Inc., New York.

AFRICA

BY WALTER FITZGERALD, M.A.

499 Pages . . . E. P. Dutton & Co., Inc., New York.

RUSSIA'S FIGHTING FORCES

BY SERGEI N. KOURNAKOFF

258 Pages . . . Duell, Sloan and Pearce, New York.

This book is written primarily for the non-military by the author who, curiously enough, while extolling the war machine of the Soviets points out that, as a former Czarist and later White Russian army officer, he fought against the Red Army for three years—during the Civil War in that country.

Obviously pro-Soviet and in many respects apologist, the work nevertheless, is highly interesting. It brings out the little known in America, long and honorable tradition of Russian arms, dating back to early XIII Century and now worthily carried on by the Red Army.

Tracing the development of the Soviet military might the author devotes considerable space to new arms and tactics as employed by Russia in the present war. He gives credit to Soviet strategy

These two books are thoroughly modern, up-to-date geographies of the continents of Australia and Africa and are especially valuable at this time when both continents are so vitally involved in the war. They are written by authors of distinguished academic attainments, whose knowledge of their subject is profound.

Doctor Taylor is professor of geography at the University of Toronto. He was formerly the Physiographer in the Commonwealth Weather Service and Professor of Geography at the University of Sydney.

Mr. Fitzgerald is senior lecturer in geography at the University of Man-

chester. Formerly he was lecturer in geography at the University of South Africa.

THE NEW ORDER IN POLAND

BY SIMON SEGAL

286 Pages . . . Alfred A. Knopf, New York.

In this scholarly work Dr. Segal, a native of Poland, provides a thorough, authoritative, factual and dispassionate study of the systematic elimination and extermination of Poles and Jews in the territories which prior to 1 September 1939 constituted the Republic of Poland.

Not content with conquering the ancient land of the Poles, a nation of 35 million people, the Nazi regime has launched a cruel policy of uprooting millions of Poles and Jews from their centuries-old homes and settling them for forced labor and other forms of servitude in the poorest and most overcrowded sections of the country. For Jews, walled ghettos have been established in cities where hundreds of thousands of these unfortunate were literally "dumped" not alone from Poland, but from other countries as well. The intellectual Poles—scientists, teachers, lawyers, doctors, clergymen—all who might conceivably become leaders of the people—are being eliminated with studied thoroughness. A great nation is being speedily converted into a community of serfs.

The book is heavily documented.

DEADLINE

BY PIERRE LAZAREFF

369 Pages . . . Random House, New York.

The author, now in the United States as a fugitive from the Nazis, is a well known French journalist. During his long years as a newspaperman and most recently as the editor-in-chief of the Paris daily "Paris-Soir," he has had the opportunity to be associated with the leading political figures in France. His story of the machinations and sinister influences which penetrated not only the French press but the French government, as well, is illuminating in the extreme. Of particular significance are chapters on the activities of the Nazi propagandist Otto Abetz, once expelled from France, who now is Hitler's "ambassador" to that country, the Stavisky affair, the "behind the scenes" story of the French defeat and the personages who have figured in that tragedy.

Library Bulletin

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America organizes to win the war. A handbook on the American war effort.

ARMSTRONG, MAJOR NEVILL. — *Fieldcraft, sniping and intelligence.*

Ayers & Sons Newspaper Directory. (1942 Edition)

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BALDWIN, HANSON W. — *Strategy for victory.* A program to defeat the dictators.

Barbary Wars. Vol. III.

BINGER, WALTER D. & RAILEY, HILTON H. — *What the citizen should know about civilian defense.*

BIRDWOOD, LORD FIELD MARSHAL. — *Khaki and gown.* An autobiography.

BISSON, T.A. — *Shadow over Asia.* The rise of militant Japan.

BURKE-WHITE, MARGARET. — *Shooting the Russian War.*

BURMAN, BEN LUCIAN. — *Miracle on the Congo.*

CALDWELL, ERSKINE. — *All-out on the road to Smolensk.*

CIVILIAN DEFENSE COUNCIL, C.C.N.Y. — *Handbook of civilian protection.*

CLARK, THOMAS D. — *The Kentucky.*

COLLINS, CLELLA REEVES. — *Army woman's handbook.*

Conversational Spanish for army air forces of the United States. Air Corps Spanish project.

COUNCIL ON FOREIGN RELATIONS. — *Our foreign policy in war and peace.*

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CUTHBERT, CAPTAIN S.J. — *We shall fight in the streets.*

DANDOUAU, A. — *Geography of Madagascar.* From the French translation.

DEAN, VERA MICHELES. — *Russia at war.*

Destruction of an army. The first campaign in Libya, September 1940 to February 1941.

DOBB, MAURICE. — *Soviet economy and the war.*

Economic Geography. Vol. 17. 1941.

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ESCUELA POLITÉCNICA. — *Year-book of the Guatemala National Military Academy.* 1941.

FAIRBAIRN, CAPTAIN W.E. — *Get tough.* How to win in hand-to-hand fighting.

Federal Register. February 1942. Nos. 23-41.

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FITZGERALD, WALTER. — *Africa.*

FLANNERY, HARRY W. — *Assignment to Berlin.*

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Foreign policy reports. Vol. 17. March 15, 1941 to March 1, 1942.

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FRIED, HANS ERNEST. — *The Guilt of the German Army.*

FULLER, J.F.C. — *Machine warfare.*

GANO, WILLIAM A. — *History of the United States Army.* Revised.

GERARD, ROBERT M. — *Tank-fighter team.*

GERVAS, FRANK. — *War has seven faces.*

GILLESPIE, DR. R.D. — *Psychological effects of war on citizen and soldier.*

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Graphic history of the war. September 1, 1939 to May 10, 1942.

GREAT BRITAIN, WAR OFFICE. — *Field service regulations.* Vol. I. Organization and Administration 1930. Reprinted with amendments (Nos. 1-11) 1939.

GRIFFIN, ROBERT A. — *School of the citizen soldier.*

HAYCRAFT, MAJOR J.M. — *Tactical notes for the infantry commander.*

HERSEY, JOHN. — *Men on Bataan.*

HEYBT, AXEL. — *Wanted — a new vision.*

HINDUS, MAURICE GERSCHON. — *Russia and Japan.*

HOOPER, MAJOR A.S. — *The Soviet fighting forces.*

HOOVER, HERBERT. — *The problems of lasting peace.*

HUTCHISON, LT. COLONEL CHARLES R. — *Personal finance and management for the army officer.*

INGERSOLL, RALPH. — *Action on all fronts.*

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JEFFERSON, LT. COLONEL J. — *Notes for section commanders.*

JOLLY. — *Field surgery in total war.*

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KRAUS, RENÉ. — *Europe in revolt.*

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Normandy.

North-Eastern France.

Paris and its environs.

Seventy miles around London.

Southern Spain and Portugal.

Switzerland.

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NAVY DEPARTMENT. — *Nova Scotia pilot.* H.O. 99.

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PROCHNOW, HERBERT V. — **The public speaker's treasure chest.**

PULESTON, CAPTAIN W.D. — **Annapolis, gangway to the quarterdeck.**

PRUSZYNSKI, KSAWERY. — **Polish invasion.** The Poles in Scotland.

QUIGLEY, HAROLD S. — **Far eastern war, 1937-1941.**

ROBORG, MAJOR PAUL C. — **Mechanized might.**

REICH MINISTRY OF TRANSPORTATION. — **The Mittellandkanal.** Translated from the German.

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RODKIN, ANGELA. — **Unveiled Iran.**

ROSS, DR. T.A. — **Lectures on war neuroses.**

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SEMEONOFF, ANNA H. — **A new Russian grammar.**

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SPIEGEL, HENRY WILLIAM. — **The economics of total war.**

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STRAUSZ-HUPE, ROBERT. — **Geopolitics.** The struggle for space and power.

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THOMPSON, COLONEL PAUL W.: **The Jap Army.**
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WADE, COLONEL G.A.: **Art of prowling.**
Factory defense.
Fighting patrol.
Fighting patrol tactics.
Fighting patrol training.
House-to-house fighting.
Road blocks.

WALDROP, FRANK C. — **MacArthur on war.**

WARD, BARBARA. — **Turkey.**

WARD, MAJOR C.R. — **Section training exercises.**

WAY, FREDERICK, JR. — **The Allegheny.**

WENGER, HERMANN LESLIE & SENSE, LOUISE. — **First aid primer.**

WERTH, ALEXANDER. — **Moscow war diary.**

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WITTMAN, KONRAD F. — **Industrial camouflage manual.**

WRITER'S PROGRAM. — **Washington D.C.** 2d Edition. Our Federal Government and how it functions.

YUGOW, A. — **Russia's economic front for war and peace.**

ZACHAROFF, LUCIEN. — **We made a mistake — Hitler.**

ZIEMER, GREGOR. — **Education for death.**

ZIM, HERBERT S. — **Parachutes.**

Directory of Periodicals

Included in this directory are only those periodicals from which articles have been selected. See also "List of Periodicals Indexed and Key to Abbreviations."

MILITARY AND NAVAL PERIODICALS

| Joint Forces | PAGE | QUARTERMASTER | PAGE |
|--|------|--|------|
| Fighting Forces (Great Britain)..... | 121 | Army Motors..... | 119 |
| Journal of the Royal United Service Institution (Great Britain)..... | 122 | Quartermaster Review..... | 123 |
| General Military | | | |
| American Defense..... | 119 | TANKS | |
| Army Officer..... | 119 | The Tank (Great Britain)..... | 124 |
| Army Quarterly (Great Britain)..... | 119 | VETERINARY | |
| An Cosantóir (Ireland)..... | 120 | Army Veterinary Bulletin..... | 119 |
| Defensa (Mexico)..... | 120 | NAVY AND MARINES | |
| A Defesa Nacional (Brazil)..... | 120 | Marine Corps Gazette..... | 122 |
| Ejercito (Spain)..... | 120 | Naval Institute Proceedings..... | 123 |
| Military Affairs..... | 122 | GENERAL | |
| Our Army..... | 123 | Aeronautical Engineering Review..... | 124 |
| Revista Militar (Argentina)..... | 123 | Asia..... | 124 |
| Revue Militaire Suisse (Switzerland)..... | 123 | Atlantic..... | 124 |
| Vojenske Rozhledy (Czechoslovakia)..... | 124 | Collier's..... | 124 |
| Arms and Services | | | |
| AIR | | | |
| Aeroplane (Great Britain)..... | 118 | Foreign Affairs..... | 124 |
| Air Forces New Letter..... | 119 | Fortune..... | 124 |
| Royal Air Force Quarterly (Great Britain)..... | 124 | Geographical Review..... | 124 |
| ARTILLERY | | | |
| Coast Artillery Journal..... | 120 | Harper's Magazine..... | 124 |
| Field Artillery Journal..... | 121 | Illustrated London News (Great Britain)..... | 124 |
| Journal of the Royal Artillery (Great Britain)..... | 122 | Kansas Historical Quarterly..... | 124 |
| CAVALRY | | | |
| Cavalry Journal..... | 119 | Liberty..... | 124 |
| CHEMICAL SERVICE | | | |
| Chemical Warfare Bulletin..... | 120 | Life..... | 124 |
| ENGINEERS | | | |
| Military Engineer..... | 122 | National Geographic..... | 125 |
| Royal Engineers Journal (Great Britain)..... | 124 | New Republic..... | 125 |
| INFANTRY | | | |
| Infantry Journal..... | 122 | The Pointer..... | 125 |
| MEDICAL | | | |
| Army Dental Bulletin..... | 119 | Readers Digest..... | 125 |
| Journal of the Royal Army Medical Corps (Great Britain)..... | 122 | Round Table (Great Britain)..... | 125 |
| Military Surgeon..... | 122 | Saturday Evening Post..... | 125 |
| ORDNANCE | | | |
| Army Ordnance..... | 119 | Science Digest..... | 125 |
| Ordnance Sergeant..... | 123 | Scientific American..... | 125 |
| GENERAL | | | |
| Aeronautical Engineering Review..... | 124 | Soviet Russia Today..... | 125 |
| Asia..... | 124 | Time..... | 125 |
| Atlantic..... | 124 | The Times (London) Weekly Edition..... | 125 |
| Collier's..... | 124 | Town & Country..... | 125 |
| Foreign Affairs..... | 124 | U.S. Air Services..... | 125 |
| Fortune..... | 124 | United States News..... | 125 |
| Geographical Review..... | 124 | Vital Speeches of the Day..... | 125 |
| Harper's Magazine..... | 124 | | |
| Illustrated London News (Great Britain)..... | 124 | | |
| Kansas Historical Quarterly..... | 124 | | |
| Liberty..... | 124 | | |
| Life..... | 124 | | |
| National Geographic..... | 125 | | |
| New Republic..... | 125 | | |
| The Pointer..... | 125 | | |
| Readers Digest..... | 125 | | |
| Round Table (Great Britain)..... | 125 | | |
| Saturday Evening Post..... | 125 | | |
| Science Digest..... | 125 | | |
| Scientific American..... | 125 | | |
| Soviet Russia Today..... | 125 | | |
| Time..... | 125 | | |
| The Times (London) Weekly Edition..... | 125 | | |
| Town & Country..... | 125 | | |
| U.S. Air Services..... | 125 | | |
| United States News..... | 125 | | |
| Vital Speeches of the Day..... | 125 | | |

Catalog of Selected Periodical Articles

This section catalogs the articles selected from Library periodicals for the current quarter. Periodicals in this catalog are arranged alphabetically.

THE AEROPLANE (Great Britain)

3 April 1942

NEW AEROPLANES OF THE RED AIR FLEET

10 April 1942

THE USE OF THE BOMBER

17 April 1942

AIR COVER FOR CONVOYS
DEFENCE AGAINST THE AIR TORPEDO

1 May 1942

SPEED IN DAY BOMBING
ON SEADROMES. C.G. Grey
WOMEN FLIGHT MECHANICS

8 May 1942

BOMBING: POLICY AND PRACTICE
GUERRILLAS ON THE SEA ROUTES
THE MITSUBISHI OO

15 May 1942

CATALOG OF SELECTED PERIODICAL ARTICLES

THE POTEZ 161 22 May 1942

ITALIAN AIR STRENGTH 12 June 1942

19 June 1942

THE VULNERABLE AIRCRAFT CARRIER
CIVIL AVIATION IN WAR-TIME CANADA. C.H. (Punch) Dickens

26 June 1942

THE RETREAT TO EGYPT
THE TORPEDO-BOMBER
THE DORNIER DO 217E1
MORE GUNS FOR GERMAN BOMBERS
A NEW JAPANESE FIGHTER

3 July 1942

SCHOOL FOR GLIDER PILOTS

AIR FORCES NEWS LETTER

July 1942

REVENGE OFF MIDWAY. Lieut. Colonel Walter C. Sweeney, Jr.
AIR WAR IN THE ALEUTIANS
GLIDERS FOR WAR. Captain Herbert O. Johansen
ROUGHING UP FOR COMBAT. Lieutenant Robert B. Hotz
HIDE AND SEEK WARFARE
THE RUSSIAN CAUCASUS. Oliver H. Townsend
THE GREAT ZERO MYSTERY. Lieutenant John M. Jenks
AIRDROMES IN WARTIME (Part II). Lieut. Colonel R.E. Smyser

AMERICAN DEFENSE

June 1942

BRITISH ATTACHE REVEALS BOMBING DETAILS. Air Commodore
H.N. Thornton, R.A.F.
COMMANDOS, PAST AND PRESENT. General H.S. Sewell

THE ARMY DENTAL BULLETIN
[Supplement to the Army Medical Bulletin]

June 1942

DENTAL SERVICE WITH TACTICAL UNITS. Colonel Neal A. Harper
FIELD MEDICINE AND SURGERY. Major Richard D. Mudd
DENTAL SERVICE AT A CAMP STATION HOSPITAL. Major Tyler J. Walker

July 1942

A REPORT OF HOSPITALIZED CELLULITIS CASES OF DENTAL ORIGIN.
Major William P. Fly, Jr.
HOSPITAL DENTAL CART. Colonel Melville A. Sanderson, and Major
Ralph D. Watkins
DENTAL HEALTH OF THE ARMY
CENTRAL DENTAL LABORATORY SERVICE
PROFESSIONAL SERVICE

ARMY OFFICER

June 1942

BOMBS
THIS IS JAPAN
CHARACTERISTICS OF ENEMY AIRCRAFT
PETROLEUM, CHEMISTRY AND WAR
NATURE'S CAMOUFLAGE
MAN'S CAMOUFLAGE

August 1942

RAILROADS IN WAR ROLE
REVIEW OF COURTS MARTIAL
REORGANIZATION OF ORDNANCE
MISSION OF STATE GUARD

ARMY ORDNANCE

July-August 1942

BOMB DEFENSE. Colonel A.M. Prentiss
KEY TO ARMS PRODUCTION. J.B. Nealey
THE BATTLE OF LIBYA
ARMS MANUFACTURE IN INDIA. S.J. Hopper
THE REVOLUTION IN ARTILLERY. Colonel Henry W. Miller
SQUAD ARMAMENT. Captain Melvin M. Johnson, Jr.

ARMY MOTORS

July 1942

BLACKOUT DRIVING BEAM
SUPPRESSORS

ARMY QUARTERLY (Great Britain)

April 1942

THE WAR ON LAND: I. EUROPE. Lieut. Colonel H. de Watteville
THE WAR ON LAND: II. MIDDLE EAST. General Sir R. Gordon-Finlayson
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THE WAR IN THE AIR. Sir E. Ellington, Marshal of the R.A.F.
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THE DEVELOPMENT OF PROPAGANDA
SOME THOUGHTS ON UNIT WELFARE. By a C.O.
A VISIT TO THE ARMY OF THE U.S.A. Lieut. Colonel H.V. Ewbank
HYGIENE IN THE ARMY. Major F. Evans

ARMY VETERINARY BULLETIN

July 1942

EQUINE ENCEPHALOMYELITIS. Colonel Raymond Randall
THE DAIRY INDUSTRY AND ARMY VETERINARY INSPECTION IN HAWAII. Colonel Jesse D. Derrick, and Major Wayne O. Kester
ULTRAVIOLET RADIATION IN MEAT STORAGE. Major Don L. Deane
CANNED SALMON EXAMINATION. Major John H. Rust 3d, and First Lieut. David L. Abshire
QUALITY OF FRESH MILK. Captain Russell M. Madison
AN EXPERIENCE WITH B. COLI CONTAMINATION OF MILK. Captain J. La Vere Davidson
THE ARTIFICIAL FEEDING OF HORSES
RABIES IN THE ARMY — 1941

CAVALRY JOURNAL

May-June 1942

JAPANESE GRAND STRATEGY
SOVIET CAVALRY OPERATIONS. Colonel P. Karpachev
THE COSSACK. Lieutenant Robert B. Rigg
EMPLOYMENT OF CAVALRY: USE OF CAVALRY DIVISIONS; CAVALRY IN RUSSIA; AIRBORNE TROOPS
AIR COMBAT POWER. F.O. Cooke
SUPER-TANKS, DEVELOPMENTS LEADING TO THE NEW HEAVY WEAPON. Brigadier General G.M. Barnes
SUPER-MACHINE GUNS. J.B. Nealey
ARMORED RECONNAISSANCE. Lieut. Colonel H.H.D. Heiberg
PHOTOGRAPHIC UNIT
LEADERSHIP. Lieut. Colonel J.J. LaPpage
THE CAVALRY R.O.T.C. AT TEXAS. Lieutenant A.P. Utterback, Jr.
R.O.T.C. UNIVERSITY OF ILLINOIS. Colonel Murray H. Ellis
UNIVERSITY OF GEORGIA CAVALRY UNIT. Lieut. Colonel O.C. Newell
CAVALRY TRAINING AT CULVER. Lieut. Colonel B.F. Hoge

July-August 1942

SOVIET CAVALRY FIGHTS. General O.I. Gorodovikov
ANTITANK DEFENSES OF A SOVIET RIFLE DIVISION. Lieut. Colonel I. Vorobev
RED TANKS OVERCOME REAL OBSTACLES
ORGANIZATION OF GERMAN DEFENSE. Major C. Lopatin
RUSSIAN CAVALRY LEADS TIMOSHENKO'S OFFENSIVE. Brigadier General H.S. Sewell
SOVIET PLATOON IN ACTION
TRAINING COSSACK RESERVES. Efim Borosh
BY CABLE FROM THE SOVIET FRONT
RUSSIAN PARTISAN WARFARE COORDINATED WITH RED ARMY. Battalion Commissar Volkov
CAVALRY STILL POTENT WEAPON SOVIETS PROVE
COMBAT INTELLIGENCE FOR ARMORED UNITS. Major Karl L. Scherer
AIR SUPPORT OF GROUND TROOPS. Major Harry Disston
ARGENTINE CAVALRY
WHY NOT THE CAMERA FOR RECONNAISSANCE? Captain Prentice G. Morgan
BATTLE PRACTICE COURSE
DETACHABLE MAP MOUNT AND TABLE. Master Sergeant Eharot, and Sergeant Leuschner
THE LOST IS FOUND — CUSTER'S LAST MESSAGE COMES TO LIGHT. Colonel W.A. Graham
GARRY OWEN
THOUGHTS FOR NEWLY APPOINTED OFFICERS. Colonel Troup Miller

MILITARY REVIEW

CHEMICAL WARFARE BULLETIN

July 1942

CHEMICAL WARFARE CHRONOLOGY OF WORLD WAR II. Summary of News Dispatches Appearing in American Daily Press for 1941 and 1942

GAS — MEN AT WORK

CIVILIAN PROTECTION

THREE PRACTICAL SUGGESTIONS

A "TAILOR-MADE" KIT FOR GAS CASUALTIES

"PRACTICE TEACHING" FOR GAS NONCOMS. Major H.G. Merrill, C.W.S.

A TREATMENT FOR WHITE PHOSPHORUS BURNS. Lieut. Commander Duncan D. Walton, U.S.N.

CHEMICAL WARFARE THROUGH THE AGES

COAST ARTILLERY JOURNAL

May-June 1942

ANTIAIRCRAFT TRAINING. Lieut. Colonel O.D. McNeely
NOT BY PAINT ALONE. Colonel Homer Saint-Gaudens

OFFICERS BY MASS PRODUCTION

GALLERY SMALL-ARMS RANGE

DISEMBARKING OPERATIONS

THE AMERICAN RED CROSS

TARGET STUKA

THE ANTIACRAFT COMMAND

JUNGLE WARFARE. Part I

July-August 1942

THE REAL THING. Lieut. Colonel L.M. Guyer

WHAT'S NEW IN FILM STRIPS. Major Harold F. Greene
COAST ARTILLERY AFLOAT. Lieutenants S. Bruce B. Jones and
Edward A. Raymond

RANGE DATA FOR HIGH SPEED TARGETS. Major W.A. Rude

LATERAL ADJUSTMENT OF FIRE. Captain C.H. Holland

RATION COMPUTING DEVICE. Lieut. Colonel A.L. Bullard

JAPANESE TACTICS AND MATERIEL

JUNGLE WARFARE. Part II

AN COSANTOIR (Ireland)

May 1942

DIVE BOMBING. Lieutenant Patrick Swan

MACHINE-GUNS IN DEFENCE. Issued by the Military College, Curragh

CIVILIANS UNDER ARMS. Colonel Ned M. Green

NIGHT OPERATIONS. Major Collins-Powell

MEN AGAINST MACHINES. Colonel S. Gurov

DEFENSA (Mexico)

May 1942

CHEMICAL ATTACKS.

[La Agresión Química.] Lieut. Colonel Augustin Ripoll

MEDICAL SERVICE OF THE INFANTRY DIVISION IN OFFENSIVE OPERATIONS.

[El Servicio de Sanidad de la División de Infantería en la Ofensiva.] Major Salvador Hernandez Vela

MEXICO IN THE ECONOMIC AND MILITARY CONFLICT.

[Méjico en la Guerra Económica y Militar.] Mario M. Saavedra

June 1942

WAR.

[La Guerra.] Brig. General Othon Lec Lobato

MODERN TECHNIQUE OF MACHINE GUN EMPLOYMENT.

[Técnica Moderna del Mando de Ametralladoras.] Colonel Vicente Guarner

EMPLOYMENT OF ARTILLERY AGAINST AIRCRAFT

[Empleo de la Artillería contra Aeronaves.] Colonel E. Florez

RAILROADS IN WAR.

[Los Ferrocarriles en la Guerra.] General G.A. Salas

THE ORGANIZATION OF AVIATION.

[Organización de la Aviación.] Captain P.A. Rubio

CHEMICAL WARFARE.

[La Agresión Química.] Lieut. Colonel A. Ripoll

CONCERNING IRREGULAR WARFARE.

[De la Guerra Irregular.] Captain C.A. de la Torre

A DEFESA NACIONAL (Brazil)

April 1942

THE DEFENSE OF CHATEAU-THIERRY.

[A defesa de Château-Thierry.] Translation by Colonel Rene

PROVISOY INSTRUCTIONS FOR THE INDOORS EMPLOYMENT OF ARTILLERY FIRING AND OBSERVATION APPARATUS.

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[Tropas alpinas.] Captain Quintana

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December 1941

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PRESENT DAY INFANTRY.

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CATALOG OF SELECTED PERIODICAL ARTICLES

ANTI-TANK CANNON. FIRING INSTRUCTION.
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MODERN ARMIES AS AFFECTED BY THEIR EQUIPMENT.
[Los Ejércitos modernos ante el material.] Lieut. Colonel G. de Mendoza

PHYSICAL EDUCATION.
[Educación física.] Major Cervera

SPORTS EVENTS FOR THE ARMY CAVALRYMAN.
[El deporte en el jinete militar.] Lieut. Colonel L. de Letona

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SIX-GUN BATTERIES.
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TROOPS IN THE SNOW.
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February 1942

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ARMY CORPS ARTILLERY.
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[Barreamientos.] Major R. López

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THE FIGHT AGAINST VENEREAL DISEASES.
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MOBILE ARTILLERY REPAIR SHOPS.
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CADRE TEST — I
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CADRE TEST — 2
FIELD ARTILLERY IN THE ATTACK. Lieutenant W.R. Young
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PERIMETERS IN PARAGRAPHS. Colonel Conrad H. Lanza
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GAS IN MODERN WAR. Colonel Alden H. Waitt
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Erskine Hume
THEY SAY. Colonel R. Ernest Dupuy
THINK IT OVER
WAR IN SNOW AND EXTREME COLD (Part One)

August 1942

DESTRUCTION OF AN ARMY (Part Two)
HOW THE GERMANS TOOK FORT EBEN EMAEL. Lieut. Colonel Paul
W. Thompson
HOW TO USE YOUR EYES AT NIGHT
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R. Stuppell
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May 1942

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JOTTINGS ON THE MEDICAL ADMINISTRATION OF AN ARMOURED
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ASTHMA IN THE BRITISH ARMY. Major Charles Sutherland
OCCUPATIONAL THERAPY. Major G.D. Kersley
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Hogarth
EXTRACTS FROM LETTERS FROM A MOBILE SURGICAL UNIT
MODIFICATIONS OF ORR'S HUT. Lieut. Colonel L.R.H. Keatinge

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THE LANDS AND PEOPLES OF INDIA. Colonel J. Franklin Bell
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July 1942

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son
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June 1942

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Leslie T. Gager
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Colonel Charles B. Daugherty
THE SURGICAL SERVICE OF THE SWISS ARMY. Egon Wildbolz
TRICHINOSIS: REPORT OF AN OUTBREAK AT CAMP EDWARDS, MASS-
ACHUSETTS. Major Alexander Marble, Captain Allen P. Skoog,
and Lieutenant Donald J. Bucholz
WARTIME CONCEPTS OF THE MOBILE FIELD LABORATORY. Captain
D.H. Drummond
THE ENLISTED ASSISTANT TO THE FLIGHT SURGEON. Captain Paul
W. Holmes
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July 1942

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Albert S. Dabney

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QUESADA'S METHOD FOR THE TREATMENT OF FRACTURES IN TOTAL WARFARE. Lieut. Colonel Fortunato Quesada
THE HINGED BOX SPLINT IN EMERGENCIES. Major E.R. Jenney
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NATURE'S WAY. III. THE FUNCTION OF MEDICAL INSPECTIONS. Victor Safford
PNEUMONIA THERAPY WITH SULFATHIAZOLE IN MILITARY PRACTICE. Major Horace P. Marvin, Captain Franklin D. Owings, and Lieutenant Edward K. Edelson
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August 1942

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THE LOCAL TREATMENT OF BURNS IN THE ARMY. Major Norman W. Thiessen, and Captain Otto S. Steinreich
MEDICAL REPLACEMENT TRAINING CENTER, CAMP GRANT, ILLINOIS. Captain William D. Looby
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ORGANIZATION AND EQUIPMENT OF A PHYSICAL THERAPY DEPARTMENT FOR CONVALESCENT AND GENERAL HOSPITALS DURING WAR. Lieut. Colonel Norman E. Titus
THE TREATMENT OF PAINFUL FEET IN THE ARMY. Major Lewis N. Cozen

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July 1942

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June 1942

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FOOD'S PART IN DEFENSE. Lieut. Colonel Paul Logan
GAS ON THE GROUND. Captain E.P. Hogan

QUARTERMASTERS ON BATAAN PERFORMED HEROIC FEATS. Frank Hewlett
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July-August 1942

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MILK FOR THE BEST-FED ARMY. Lieutenant George R. Bishop
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THE PACKAGING AND PACKING OF SUBSISTENCE ITEMS FOR OVERSEAS SHIPMENT BY THE ARMY. Major Cecil G. Dunn
RATION BREAK-DOWN BOARD
THE NON-PERISHABLE BRANCH. Major R.B. Carhart
THE RED CROSS SERVICE PROGRAM. George Corson
ARMY FOODS — ARMY MENUS — REFLECT SCIENTIFIC SELECTION AND PREPARATION. Colonel Rohland A. Isker

REVISTA MILITAR (Argentina)

March 1942

FIRE POSSIBILITIES WITH CANNON.
 [La posibilidad de tiro de una boca de fuego.] Lieut. Colonel Julio A. Rodriguez
ESTIMATE OF SITUATION AND SOLUTION.
 [Apreciación de situación y resolución.] Major Juan Esteban Vacca
EFFECTS OF LOW TEMPERATURES ON AERIAL NAVIGATION.
 [Influencias de las temperaturas bajas en la navegación aérea.] Major H.A. Srito

THE RELIEF OF UNITS DURING COMBAT.
 [El relevo de unidades en el combate.] Captain A.E. Lammirato
EXERCISE FOR THE CADRE OF DEMOLITION ENGINEER SECTIONS.
 [Ejercicio de cuadros de Sección de Zapadores Destructores.] Lieutenant A.O. Pfister

CENTRAL FIRE CONTROL POST.
 [La Central de Tiro.] Lieutenant Manual Iricibar

AN EXAMPLE OF MILITARY HISTORY.
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April 1942

MILITARY AND LABOR CONSCRIPTION.
 [La conscripción militar y la conscripción obrera.] Colonel J.B. Crespo

CONCERNING THE GIVING OF ORDERS.
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COMMENTS ON THE FORCED CROSSING OF THE STRAITS OF JOHORE.
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Colonel T.C.W. Bowen
A GERMAN RIVER CROSSING NOT ACCORDING TO PLAN. Brigadier
General Sir James Edmonds
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PROPAGANDA AND THE SOLDIER. "Octuple"
SHORTCOMINGS OF COMMERCIAL STEAM DISINFECTION APPARATUS.
Lieut. Colonel A.G. Gadd and Major A.W. Turner
HUNTING AND TRAINING FOR WAR. Major General W. Baker Brown
A BRAINS' TRUST FOR THE ARMY. Lieut. Colonel D. Portway

THE TANK (Great Britain)
June 1942

HOW IT FEELS TO FIGHT IN A TANK

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CAUSES OF FRENCH DEFEAT IN 1940.
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General

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June 1942

RECENT DEVELOPMENTS IN AIRSHIPS. K. Arnstein

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July 1942

PEACE AMBS IN THE PACIFIC. H.J. Timperley
ASIA WANTS FREEDOM NOW. Taraknath Das:
CAN JAPAN COUNT ON FORMOSA. Mary A. Nourse
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ETHIOPIA — SILENT PARTNER. Robert Gale Woolbert
JAPAN'S LOSSES AT SEA. Leonard Engel
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ATLANTIC
July 1942

THE IMAGE OF VICTORY. Archibald MacLeish
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COLLIER'S
18 July 1942

SECOND THOUGHTS ON A SECOND FRONT. Quentin Reynolds

25 July 1942

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1 August 1942

BATAAN NURSE. Eunice C. Hatchitt
FLIGHT WITH QUEZON. Nat Floyd

8 August 1942

BORN TO FLY. W.B. Courtney
ACE HIGH. Lieutenant E.S. McCuskey

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July 1942

AMERICA AT WAR: THE SECOND QUARTER. Hanson W. Baldwin
POLICY AND STRATEGY IN THE WAR IN RUSSIA. X
SOUTH AMERICAN PERPLEXITIES. Fernando de los Rios
GERMAN PREPARATIONS IN THE MIDDLE EAST. C.L. Sulzberger
THE FIGHT FOR DEMOCRACY IN ASIA. Owen Lattimore
HITLER'S TRANSFERS OF POPULATION IN EASTERN EUROPE. Hedwig Wachenheim
HAUSHOFER AND THE PACIFIC. Hans W. Weigert
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FORTUNE
June 1942

THE WAR OF DISTANCES
WHO SHOULD GET THE SHIPS
ATLANTIC AREA
THE JOB BEFORE US

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July 1942

A ROUTE TO ALASKA THROUGH THE NORTHWEST TERRITORIES. Richard Finnie
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HARPER'S MAGAZINE
July 1942

SKY TRUCKS COMING. William M. Sheehan
DRAFTING THIS ARMY. Frederick Lewis Allen
HOW LATIN AMERICANS DIE. Charles Morrow Wilson
BETWEEN HITLER AND MUSSOLINI. Ernst Rüdiger Prince Starhemberg
THE SOURCES OF GERMANY'S MIGHT. Leonard Engel

ILLUSTRATED LONDON NEWS (Great Britain)

2 May 1942

COMMANDOS AND THEIR RAIDS. Cyril Falls

9 May 1942

LUFTWAFFE DEVELOPMENTS: GERMANY'S NEW FIGHTERS & BOMBERS

KANSAS HISTORICAL QUARTERLY
May 1942

THE FORT LEAVENWORTH — FORT GIBSON MILITARY ROAD AND
THE FOUNDING OF FORT SCOTT. Louise Barry

LIBERTY
6 June 1942

THE "BURMA ROAD" TO ALASKA
WHEN THE REPULSE WENT DOWN. Cecil Brown

18 July 1942

HOW SOLDIERS ARE KEPT WELL. Morris Markey

8 August 1942

HOW WAR SAVES LIVES. Morris Markey

15 August 1942

CAN BOMBINGS MAKE GERMANY QUIT? Major Alexander P. de
Seversky
"HELL-OF-A-BEATING" STILWELL. Raymond Clapper

LIFE

20 July 1942

AXIS OPENS ITS BIG 1942 DRIVE
JAPANESE PICTURES SHOW FALL OF BATAAN AND ATTACK ON
PEARL HARBOR
THE RUSSIAN BATTLEFRONT. C.L. Sulzberger
THE JEEP

CATALOG OF SELECTED PERIODICAL ARTICLES

27 July 1942

SECOND FRONT?
ATLANTIC CONVOY

NATIONAL GEOGRAPHIC

July 1942

THE NEW QUEEN OF THE SEAS. Melville Bell Grosvenor
WAR AWAKENED NEW CALEDONIA. Enoz de Chetelat
SOUTH SEA ISLE OF MINERAL MOUNTAINS
ROAMING RUSSIA'S CAUCASUS. Rolf Singer
LIFE IN DAUNTLESS DARWIN, AUSTRALIA. Howell Walker

August 1942

UNKNOWN JAPAN. Willard Price

NEW REPUBLIC

22 June 1942

FIRST YEAR OF THE GERMAN-SOVIET WAR

29 June 1942

JAPAN'S ALASKAN STRATEGY

20 July 1942

TAKING OFFICERS FROM THE RANKS

3 August 1942

AIR FREIGHT V. U-BOAT. Richard Lee Strout
HITLER'S RISK, RUSSIA'S PERIL. Max Werner

10 August 1942

THE NEED FOR GLOBAL STRATEGY. Frederick L. Schuman

THE POINTER

29 May 1942

REVENGE FOR CUSTER. Captain John G. Bourke

READERS DIGEST

July 1942

EYEWITNESS EPIC: THE HEROIC DEFENSE OF THE PHILIPPINES.
Lieut. Colonel Warren J. Clear
VICTORY THROUGH AIR POWER. Major Alexander P. de Seversky

ROUND TABLE (Great Britain)

June 1942

THE HIGH COMMAND

IRELAND TO-DAY

THE STRATEGY OF THE WAR. XI

WAR PICTURE FROM U.S.A.

SATURDAY EVENING POST

8 August 1942

WHAT WE CAN EXPECT FROM CHINA? Edgar Snow

SCIENCE DIGEST

August 1942

ALASKA — OUR SPEARHEAD IN THE PACIFIC. Richard L. Neuberger

SCIENTIFIC AMERICAN

July 1942

FOOD FOR FIGHTERS

SOVIET RUSSIA TODAY

August 1942

PARACHUTES IN RUSSIA. Herbert L. Zim

TIME

2 June 1942

BATTLE OF CHINA. THE INCIDENT BECOMES A CRISIS

THE TIMES (LONDON) WEEKLY EDITION

27 May 1942

AN ARMY WITHOUT MACHINES. SUCCESSFUL JAPANESE METHODS
IN BURMA
THE STORMING OF MADAGASCAR. HOW THE NAVAL BASE WAS
TAKEN

3 June 1942

MEXICO A BELLIGERENT. VITAL STRATEGIC POSITION BETWEEN
U.S.A. AND PANAMA CANAL

10 June 1942

LANDING NEAR BOULOGNE. RECONNAISSANCE BY COMMANDO
TROOPS

15 July 1942

NEW LAND BRIDGE TO RUSSIA
WHAT JAPAN PLANS. THE MAJOR EFFORT OF THIS YEAR
FIGHTING THE U-BOAT. A VIGIL FROM ICELAND TO GIBRALTAR

TOWN & COUNTRY

August 1942

DEFENSE IS NO DEFENSE. Pertinax

U. S. AIR SERVICES

June 1942

CONGRESSIONAL MEDAL OF HONOR AWARDED LEADER OF TOKYO
RAID
JAPAN'S TIMETABLE OF PACIFIC CONQUEST PROPHETICALLY OUT-
LINED — Review of Secret Volume How Japan Plans to Win,
by Matsuo. Major Frank L. Nelson

July 1942

BLIMPS WILL ATTEMPT TO CLEAR TROPIC SEAS OF SUBMARINE
MENACE. Doris S. Hunt
CLIPPERS AT WAR
CURTIS TOMAHAWKS AT THE LENINGRAD FRONT. S. Marvich
THE BATTLE OF THE CORAL SEA
THOSE 1,000 PLANE RAIDS OVER GERMANY

August 1942

PATROL PLANES AT SEA. Colonel Nikolai D. Ezhov

UNITED STATES NEWS

31 July 1942

INFLATION. THE FACTS BEHIND NEW WARNINGS
POLITICS IN WARTIME: ISSUES BEFORE VOTERS
NEW BLOW TO HEMISPHERE TRADE

VITAL SPEECHES OF THE DAY

1 July 1942

OUR HERITAGE OF FREEDOM. Lieutenant General Henry H. Arnold

1 August 1942

THE SERIOUSNESS OF THE WAR. The Honorable Cordell Hull,
Secretary of State
TRANSPORTATION AND VICTORY. Joseph B. Eastman

Subject Index

LIST OF PERIODICALS INDEXED AND KEY TO ABBREVIATIONS

Aero = Aeroplane (Great Britain)
AF News Let = Air Force News Letter
Amer Def = American Defense
A Dental Bul = Army Dental Bulletin
A Off = The Army Officer
A Ord = Army Ordnance
A Mot = Army Motors
A Quar = Army Quarterly (Great Britain)
A Vet Bul = Army Veterinary Bulletin
Cav Jour = Cavalry Journal
Chem War = Chemical Warfare Bulletin
CA Jour = Coast Artillery Journal
An Cos = An Cosantóir (Ireland)
Defensa = Defensa (Mexico)
Def Nac = A Defesa Nacional (Brazil)
Ejercito = Ejercito (Spain)
FA Jour = Field Artillery Journal
Ftg Forc = Fighting Forces (Great Britain)
Inf Jour = Infantry Journal
Jour RAMC = Journal of the Royal Army Medical Corps (Great Britain)
Jour R Art = Journal of the Royal Artillery (Great Britain)
Jour RUSI = Journal of the Royal United Service Institution (Great Britain)
MC Gaz = Marine Corps Gazette
Mil Af = Military Affairs

Mil Eng = Military Engineer
Mil Surg = Military Surgeon
Nav Inst Proc = Naval Institute Proceedings
Ord Ser = Ordnance Sergeant
Our Army = Our Army
QM Rev = Quartermaster Review
Rev Mil = Revista Militar (Argentina)
Rev Mil Suisse = Revue Militaire Suisse (Switzerland)
RAF Quar = Royal Air Force Quarterly (Great Britain)
Roy Eng Jour = Royal Engineers Journal (Great Britain)
Tank = The Tank (Great Britain)
Voj Roz = Vojenské Rozhledy (Czechoslovakia)

GENERAL

Aero Eng Rev = Aeronautical Engineering Review
Asia = Asia
Atlantic = Atlantic
Collier's = Collier's
For Aff = Foreign Affairs
Fortune = Fortune
Geog Rev = Geographical Review
Harper's = Harper's Magazine
Ill Lon News = Illustrated London News (Great Britain)

Kans Hist Quar = Kansas Historical Quarterly
Lib = Liberty
Life = Life
Nat Geog = National Geographic Magazine
New Rep = New Republic
Pointer = The Pointer
Readers Dig = Readers Digest
Round Table = Round Table (Great Britain)
Sat Eve Post = Saturday Evening Post
Sci Dig = Science Digest
Scien Amer = Scientific American
Sov Rus = Soviet Russia Today
Time = Time
Times [London] = The Times (London) Weekly Edition
Town & Country = Town & Country
U.S. Air Services = U.S. Air Services
U.S. News = United States News
Vit Speeches = Vital Speeches of the Day

| | |
|-----------------------|------------------------|
| Jan = January | Jul = July |
| Feb = February | Aug = August |
| Mar = March | Sep = September |
| Apr = April | Oct = October |
| May = May | Nov = November |
| Jun = June | Dec = December |

A

AFRICA (NORTH)

An enemy strong point in the Libyan Desert. [See main article section]
Axis opens its big 1942 drive. (Life — 20 Jul 1942)
Destruction of an army. (Inf Jour — Jul, Aug 1942)
Perimeters in paragraphs. (FA Jour — Aug 1942)
Retreat from Libya. [See "Foreign Military Digests" Section]

AIR ARM

Command and Staff

Born to fly. (Collier's — 8 Aug 1942)

Organization and Equipment

Airborne troops. (Cav Jour — May-Jun 1942)
Air combat power. (Cav Jour — May-Jun 1942)
Airdromes in wartime. (AF News Let — Jul 1942)
Battle of the Coral Sea. (U.S. Air Services — Jul 1942)
Blimps will attempt to clear Tropic Seas of submarine menace. (U.S. Air Services — Jul 1942)
Can bombings make Germany quit? (Lib — 18 Aug 1942)
Curtiss "Tomahawks" at the Leningrad Front. (U.S. Air Services — Jul 1942)
Dornier Do 217 El. (Aero — 26 Jun 1942)
Gliders for war. (AF News Let — Jul 1942)
Great zero mystery. (AF News Let — Jul 1942)
Ground defense of aerodromes. [See "Foreign Military Digests" Section]
Luftwaffe developments: Germany's new fighters and bombers. (Ill Lon News — 9 May 1942)
Mitsubishi OO. (Aero — 15 May 1942)
Observation aviation. [See main article section]
Organic air observation for field artillery. (FA Jour — Jul 1942)
Organization of aviation. (Defensa — Jun 1942)
Our heritage of freedom. (Vit Speeches — 1 Jul 1942)
Patrol planes at sea. (U.S. Air Services — Aug 1942)
Recent development in airships. (Aero Engr Rev — Jun 1942)
School for glider pilots. (Aero — 3 Jul 1942). [See also "Foreign Military Digests" Section]

Sky trucks coming. (Harper's — Jul 1942)
Some remarks concerning the use of aviation in combat. [See "Foreign Military Digests" Section]
The Luftwaffe. [See "Foreign Military Digests" Section]
Torpedo-bomber. (Aero — 26 Jun 1942)
Vulnerable aircraft carrier. (Aero — 19 Jun 1942)

Personnel

Women flight mechanics. (Aero — 1 May 1942)

Training Tactics

Air support of ground troops. (Cav Jour — Jul-Aug 1942)
Air war in the Aleutians. (AF News Let — Jul 1942)
Battle of the Coral Sea. (U.S. Air Services — Jul 1942)
Blimps will attempt to clear Tropic Seas of submarine menace. (U.S. Air Services — Jul 1942)
Born to fly. (Collier's — 8 Aug 1942)
Can bombings make Germany quit? (Lib — 18 Aug 1942)
Coastal Command. (Jour RUSI — May 1942)
Dive bombing. (An Cos — May 1942)
German spring air tactics. [See "Foreign Military Digests" Section]
Gliders for war. (AF News Let — Jul 1942)
Hide and seek warfare. (AF News Let — Jul 1942)
It can happen here. [See main article section]
Naval aerial menace number one. (Nav Inst Proc — Aug 1942)
Observation aviation. [See main article section]
Organic air observation for field artillery. (FA Jour — Jul 1942)
Our heritage of freedom. (Vit Speeches — 1 Jul 1942)
Revenge off Midway. (AF News Let — Jul 1942)
Some remarks concerning the use of aviation in combat. [See "Foreign Military Digests" Section]
School for glider pilots. (Aero — 3 Jul 1942)
Sky trucks coming. (Harper's — Jul 1942)
Spring tactics of enemy bombers. [See "Foreign Military Digests" Section]
Target Stuka. (CA Jour — May-Jun 1942)
Use of the bomber. (Aero — 10 Apr 1942)

AIR POWER

Air combat power. (Cav Jour — May-Jun 1942)
Bombers. (A Off — Jun 1942)
Bombing: policy and practice. (Aero — 8 May 1942)
British air attaché reveals bombing details. (Amer Defen — Jun 1942)
Can bombings make Germany quit? (Lib — 15 Aug 1942)
Civil aviation in war-time Canada. (Aero — 19 Jun 1942)
Disembarking operations. (CA Jour — May-Jun 1942)
Italian air strength. (Aero — 12 Jun 1942)
Naval aerial menace number one. (Nav Inst Proc — Aug 1942)
New aeroplanes of the red air fleet. (Aero — 3 Apr 1942)
Potez 161. (Aero — 22 May 1942)
Seversky: "Air power!" — Nickerson: "Not enough!" (FA Jour — Jul 1942)
Speed in day bombing. (Aero — 1 May 1942)
Storming of Madagascar. How the naval base was taken. (Times [London] — 20 May 1942)
The Luftwaffe. [See "Foreign Military Digests" Section]
Those 1,000 plane raids over Germany. (U.S. Air Services — Jul 1942)
Victory through air power. (Readers Dig — Jul 1942)
War in the air. (A Quar — Apr 1942)

AIR RAID SHELTERS

Air raid shelters. (Ejercito — Jan 1942)
Bomb defense. (A Ord — Jul-Aug 1942)
Royal army medical corps hospital in Crete. [See "Foreign Military Digests" Section]

AIR WARFARE

Ace high. (Collier's — 8 Aug 1942)
Air cover for convoys. (Aero — 17 Apr 1942)
America at war. (For Aff — Jul 1942)
Battle of the Coral Sea. (U.S. Air Services — Jul 1942)
Bomb defense. (A Ord — Jul-Aug 1942)
Bombing: policy and practice. (Aero — 18 May 1942)
Can bombings make Germany quit? (Lib — 15 Aug 1942)

READER'S GUIDE AND SUBJECT INDEX

Co-operation or co-ordination. (Ftg Forc — Apr 1942)
 Defense against the air torpedo. (Aero — 17 Apr 1942)
 Dive bombing. (An Cos — May 1942)
 Escapes: III. — Fighter planes and pilots take hard knocks. (RAF Quar — Jun 1942)
 Fighting the U-Boats. A vigil from Iceland to Gibraltar. (Times [London] — 15 Jul 1942)
 German spring air tactics. [See "Foreign Military Digests" Section]
 Hide and seek warfare. (AF News Let — Jul 1942)
 Importance of naval and air task forces in global warfare. (Nav Inst Proc — Jun 1942)
 It can happen here. [See main article section]
 New queen of the seas. (Nat Geog — Jul 1942)
 Notes on the war in the air. (Ftg Forc — Jun 1942)
 Revenge off Midway. (AF News Let — Jul 1942)
 Road to Dunkirk. (FA Jour — Jul 1942)
 Speed in day bombing. (Aero — 1 May 1942)
 Those 1,000 plane raids over Germany. (U.S. Air Services — Jul 1942)
 Use of the bomber. (Aero — 10 Apr 1942)
 Wake Island. (MC Gaz — Jun 1942)
 War in the air. (A Quar — Apr 1942)

AIRWAYS

Air freight v. U-boat. (New Rep — 3 Aug 1942)

ALASKA

Air war in the Aleutians. (AF News Let — Jul 1942)
 Alaska — our spearhead in the Pacific. (Sci Dig — Aug 1942)
 "Burma Road" to Alaska. (Lib — 6 Jun 1942)
 Japan's Alaskan strategy. (New Rep — 29 Jun 1942)
 Route to Alaska through the northwest territories. (Geog Rev — Jul 1942)

AMMUNITION

Ammunition in combat. (FA Jour — Jun 1942)

ANTIAIRCRAFT ARTILLERY

Antiaircraft artillery with the field forces. [See main article section]
 Antiaircraft command. (CA Jour — May-Jun 1942)
 Antiaircraft training. (CA Jour — May-Jun 1942)
 Employment of artillery against aircraft. (Defensa — Jul 1942)
 Gallery small-arms ranges. (CA Jour — May-Jun 1942)

ANTIAIRCRAFT DEFENSE

Antiaircraft weapons and the progress of aviation. (Ejercito — Dec 1941)
 Defense against the air torpedo. (Aero — 17 Apr 1942)
 Home-guard. (Jour RUSI — May 1942)

ANTITANK

Antitank artillery of the Red Army. (FA Jour — Aug 1942)
 Antitank cannon. (Ejercito — Jan 1942)
 Antitank defense. (Ejercito — Nov 1941)
 Antitank defenses of a Soviet rifle division. (Cav Jour — Jul-Aug 1942)
 Japanese antitank defense. (MC Gaz — Jun 1942)
 Japanese principles of antitank defense. [See "Foreign Military Digests" Section]
 Obstacles. (Ejercito — Mar 1942)

ARGENTINA (ARMY OF)

Argentine cavalry. (Cav Jour — Jul-Aug 1942)

ARMORED FORCES

Armored reconnaissance. (Cav Jour — May-Jun 1942)
 Combat intelligence for armored units. (Cav Jour — Jul-Aug 1942)
 Tank attack down a road. (FA Jour — Jun 1942)

ART OF WAR STRATEGY

America at war. (For Aff — Jul 1942)
 An army without machines. Successful Japanese methods in Burma. (Times [London] — 27 May 1942)
 Battle of China. (Time — 2 Jun 1942)
 Battle of the frontier. (Mil Af — Summer 1942)
 Can bombings make Germany quit? (Lib — 15 Aug 1942)
 Co-operation or co-ordination. (Ftg Forc — Apr 1942)
 Destruction of an army. (Inf Jour — Jul-Aug 1942)
 Field Artillery in the attack. (FA Jour — Jul 1942)
 First year of the German-Soviet war. (New Rep — Jun 1942)
 German preparations in the middle east. (For Aff — Jul 1942)
 Hitler's risk, Russia's peril. (New Rep — 3 Aug 1942)
 How the Germans took Fort Eben Emael. (Inf Jour — Aug 1942)

If Japan and America fight. [See main article section]
 Importance of naval and air task forces in global warfare. (Nav Inst Proc — Jun 1942)
 Interior versus exterior lines. [See "Foreign Military Digests" Section]
 Japanese grand strategy. (Cav Jour — May-Jun 1942)
 Machine-guns in defense. (AN Cos — May 1942)
 Men against machines. (An Cos — May 1942)
 Need for global strategy. (New Rep — 10 Aug 1942)
 New queen of the seas. (Nat Geog — Jul 1942)
 Night operations. (An Cos — May 1942)
 Notes on the war in the air. (Ftg Forc — Jun 1942)
 On seadromes. (Aero — 1 May 1942)
 Organic air observation for field artillery. (FA Jour — Jul 1942)

Plan of battle to win the war. (Our Army — Jun 1942)
 Policy and strategy in the war in Russia. (For Aff — Jul 1942)
 Russo-German war. (FA Jour — Jun, Jul, Aug 1942)
 Second thoughts on a second front. (Collier's — 18 Jul 1942)
 Seversky: "Air power" — Nickerson: "Not enough!" (FA Jour — Jul 1942)
 Strategy of great areas. (Rev Mil Suisse — Apr 1942)
 Super battle of 1942. (Our Army — Jul 1942)
 Two views of war. (Inf Jour — Jun 1942)
 Victory through air power. (Readers Dig — Jul 1942)
 War. (Defensa — Jun 1942)
 War in snow and extreme cold. (Inf Jour — Jul, Aug 1942)
 War of distances. (Fortune — Jun 1942)
 Will Japan drive westward. (Asia — Jul 1942)

ARTILLERY

Organization and Equipment

Army corps artillery. (Ejercito — Feb 1942)
 Artillery, fire. (Ejercito — Apr 1942)
 Artillery group commander. (Ejercito — Nov 1941)
 Inspection and adjustment of the 105mm howitzer recoil mechanism. (Ord Ser — Jun 1942)
 Mobile artillery repair shops. (Ejercito — Apr 1942)
 Mortars, howitzers and cannon. (Ejercito — Feb 1942)
 On behalf of the 25-PR. (Jour R Art — Aug 1942)
 Provisory instructions for the indoors employment of artillery firing and observation apparatus. (Def Nac — Apr 1942)
 Regimental organization. (Jour R Art — Aug 1942)
 Revolution in artillery. (A Ord — Jul-Aug 1942)
 Six-gun batteries. (Ejercito — Jan 1942)

Training Tactics

Artillery fire. (Ejercito — Feb, Apr 1942)
 Artillery in defense of a coast line. (FA Jour — Jun 1942)
 Artillery-Infantry cooperation. [See main article section]
 Artillery preparation. (FA Jour — Aug 1942)
 Artillery recruit training. (Jour R Art — Aug 1942)
 Artillery support for tank attack. [See "Foreign Military Digests" Section]
 Battle of the Ebro. Artillery action. (Ejercito — Dec 1941)
 Cadre test. (FA Jour — Jun, Jul 1942)
 Calculation of trajectories. (Ejercito — Apr 1942)
 Concrete case of the employment of German artillery. (Rev Mil — Mar 1942)
 Cooperation between artillery and infantry heavy weapons. (FA Jour — Jun 1942)
 Correction of artillery fire. (Ejercito — Nov 1941)
 Directional pointing of field and mountain artillery. (Ejercito — Mar 1942)
 Doc-Luc improved mount. (FA Jour — Aug 1942)
 Employment of artillery against aircraft. (Defensa — Jun 1942)
 Field artillery in the attack — a plea for the offensive spirit — with some practical points. (FA Jour — Jul 1942)
 Field artillery in the attack. [See "Foreign Military Digests" Section]
 Field artillery in offense. [See main article section]
 How they did it. (FA Jour — Jun 1942)
 Improvised sight for FA trainer. (FA Jour — Aug 1942)
 Infantry and artillery — their cooperation in the Italian army. (Ejercito — Nov 1942)
 Organic air observation. (FA Jour — Jul 1942)
 Signal Mountain translated. (FA Jour — Aug 1942)
 "Scope" for the train board. (FA Jour — Aug 1942)
 Solutions to cadre tests. (FA Jour — Jun 1942)
 Subcaliber at USMA. (FA Jour — Aug 1942)
 Suggestions about base angles. (FA Jour — Aug 1942)
 Tactics of artillery. With special reference to the Germans. (Jour R Art — Aug 1942)
 Through the mill. (FA Jour — Jul 1942)

ASIA

Asia wants freedom now. (Asia — Jul 1942)
 Fight for democracy in Asia. (For Aff — Jul 1942)

AUSTRALIA

Australia on the firing line. (Asia — Jul 1942)
 Fuel for the Australian base. (Asia — Jul 1942)
 Life in dauntless Darwin. (Nat Geog — Jul 1942)
 Situation in the Far East. (Ftg Forc — Apr 1942)

B

BASES

Guerrillas on the sea routes. (Aero — 15 May 1942)
 Overseas base sections. (Mil Engr — Jun 1942)
 Situation in the Far East. (Ftg Forc — Apr 1942)

BOARDS

Notes on some random activities of the field artillery board. (FA Jour — Jul 1942)

BURMA

"Hell-of-a-beating" Stilwell. (Lib 15 Aug 1942)
 Services of the artillery in Burma, Malaya, and the Dutch East Indies during the last century. (Jour R Art — Aug 1942)

C

CAMOUFLAGE

Man's camouflage. (A Off — Jun 1942)
 Nature's camouflage. (A Off — Jun 1942)
 Not by paint alone. (CA Jour — May-Jun 1942)

CANADA

Civil aviation in war-time Canada. (Aero — 19 Jun 1942)

CANADA ARMY OF

The Canadian Army in England. (A Quar — Apr 1942)

CASUALTIES

German casualties in Russia. (FA Jour — Jun 1942)
 Policy and strategy in the war in Russia. (For Aff — Jul 1942)

CAVALRY

Organization and Equipment

Employment of cavalry. (Cav Jour — May-Jun 1942)
 Garry Owen. (Cav Jour — Jul-Aug 1942)
 Mechanized cavalry. (Ejercito — Jul 1942)
 Photograph unit. (Cav Jour — May-Jun 1942)
 Subcaliber. (FA Jour — Aug 1942)

Training Tactics

Cavalry. (Rev Mil — Apr 1942)
 Cavalry in the defensive battle. (Ejercito — Mar 1942)
 Cavalry in Russia. (Cav Jour — May-Jun 1942)
 Cavalry R.O.T.C. at Texas. (Cav Jour — May-Jun 1942)

Cavalry still potent weapon Soviets prove. (Cav Jour — Jul-Aug 1942)

Cavalry tactics. (Def Nac — Apr 1942)

Cavalry training at Culver. (Cav Jour — May-Jun 1942)

Horse sense. (Our Army — Jul 1942)

R.O.T.C. University of Illinois. (Cav Jour — May-Jun 1942)

Russian cavalry leads Timoshenko's offensive. (Cav Jour — Jul-Aug 1942)

Soviet cavalry fights. (Cav Jour — Jul-Aug 1942)

Soviet cavalry operations. (Cav Jour — May-Jun 1942)

Soviet platoon in action. (Cav Jour — Jul-Aug 1942)

Training Cossack reserves. (Cav Jour — Jul-Aug 1942)

University of Georgia cavalry unit. (Cav Jour — May-Jun 1942)

CHEMICAL SERVICE

Chemical attacks. (Defensa — May 1942)

Chemical warfare. (Defensa — Jun 1942)

Chemical warfare. (Ejercito — Nov 1941)

Chemical warfare chronology of World War II. (Chem War — Jul 1942)

Chemical warfare through the ages. (Chem War — Jul 1942)

Civilian protection. (Chem War — Jul 1942)

Gas in modern war. (Inf Jour — Jul 1942)

Gas — men at work. (Chem War — Jul 1942)

Petroleum, chemistry and war. (A Off — Jun 1942)
 "Practice teaching" for gas noncoms. (Chem War — Jul 1942)

"Tabor made" kit for gas casualties. (Chem War — Jul 1942)

Three practical suggestions. (Chem War — Jul 1942)

Treatment for white phosphorous burns. (Chem War — Jul 1942)

CHINA

Battle of China. (Time — 2 Jun 1942)

"Hell-of-a-beating" Stilwell. (Lib — 15 Aug 1942)

What we can expect from China. (Sat Eve Post — 8 Aug 1942)

CIVILIAN DEFENSE

Civilian protection. (Chem War — Jul 1942)

CLIMATE

His Excellency, General Weather. (Ejercito — Mar 1942)

COAST ARTILLERY

Coast artillery afloat. (CA Jour — Jul-Aug 1942)

Coastal small-arms range. (CA Jour — May-Jun 1942)

Lateral adjustment of fire. (CA Jour — Jul-Aug 1942)

Officers by mass production. (CA Jour — May-Jun 1942)

Range data for high speed targets. (CA Jour — Jul-Aug 1942)

Ration computing device. (CA Jour — Jul-Aug 1942)

Target stuka. (CA Jour — May-Jun 1942)

What's new in film strips? (CA Jour — Jul-Aug 1942)

COAST DEFENSE

Artillery in defense of a coast line. (FA Jour — Jun 1942)

Home guard. (Jour USII — May 1942)

COMMAND, STAFF, AND LOGISTICS

A combined general staff. [See "Foreign Military Digests" Section]

Age and field command. [See main article section]

Antiaircraft command. (CA Jour — May-Jun 1942)

Artillery group commander. (Ejercito — Nov 1941)

High command. (Round Table — Jun 1942)

Job before us. (Fortune — Jun 1942)

Relief of units during combat. (Rev Mil — Mar 1942)

The "Führer's" general staff officers. [See "Foreign Military Digests" Section]

The real thing. (CA Jour — Jul-Aug 1942)

War of distances. (Fortune — Jun 1942)

MILITARY REVIEW

COMMANDOS

Commandos and their raids. (Ill Lon News — 2 May 1942)
Commandos, past and present. (Amer Def — Jun 1942)
Excursion to Norway. Commando in action. (Atlantic — Jul 1942)
Landing near Boulogne. Reconnaissance by commando troops. (Times [London] — 10 Jun 1942)

CONSTRUCTION PROJECTS (WAR)

Bomb defense. (A Ord — Jul-Aug 1942)
Wood pipe can also serve. (Mil Eng — Jun 1942)

CONVOYS

Air cover for convoys. (Aero — 17 Apr 1942)
Coastal command. (Jour RUSI — May 1942)
Convoy defense. (QM Rev — May-Jun 1942)

COOPERATION

Action at Arras. (Ftg Forc — Jun 1942)
Air support of ground troops. (Cav Jour — Jul-Aug 1942)
Artillery-Infantry cooperation. [See main article section]
Aviation and ground forces. (Ejercito — Jan 1942)
Combat teams. (FA Jour — Jul 1942)
Cooperation between artillery and infantry heavy weapons. (FA Jour — Jun 1942)
Japanese landing operations. (MC Gaz — Jun 1942)
Medical soldier and the infantryman. (Inf Jour — Jul 1942)

COURTS-MARTIAL

Justice in a war-time army. [See main article section]
Review of courts martial. (A Off — Aug 1942)

D

DECORATIONS

Congressional medal of honor awarded leader of Tokyo raid. (U.S. Air Services — Jun 1942)

DEMOLITIONS

Concerning the infantry sapper. [See "Foreign Military Digests" Section]
How the Germans took Fort Eben Emael. (Inf Jour — Aug 1942)
Italian parachute raid. (Roy Eng Jour — Jun 1942)

DISEASES

How Latin Americans die. (Harper's — Jul 1942)

DUTCH EAST INDIES

The services of the artillery in Burma, Malaya, and the Dutch East Indies during the last century. (Jour R Art — Aug 1942)

E

ECONOMICS

Economic warfare tactics. (Mil Af — Spring 1942)
How strong is Japan? (Mil Af — Spring 1942)
Mexico in the economic and military conflict. (Defensa — May 1942)

ENCIRCLEMENT

Policy and strategy in the war in Russia. (For Aff — Jul 1942)

ENGINEERS

Beach protection measures. (Mil Eng — Jun 1942)
Exercise for the cadre of demolition engineer section. (Rev Mil — Mar 1942)
German engineers in the war. [See "Foreign Military Digests" Section]
German river crossing not according to plan. (Roy Eng Jour — Jun 1942)
History of the U.S. topographical engineers, 1813-1863. (Mil Eng — Jun 1942)
Insignia of the Corps of engineers. (Mil Eng — Jul 1942)
Italian parachute raid. (Roy Eng Jour — Jun 1942)
Leadership rating of engineer officer candidates. (Mil Eng — Aug 1942)
New land bridge to Russia. (Times [London] — 15 Jul 1942)
Overseas base sections. (Mil Eng — Jun 1942)
Problems of the Sacramento River. (Mil Eng — Apr 1942)
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EQUITATION

The Cossack. (Cav Jour — May-Jun 1942)

ETHNOLOGY

Hitler's transfers of population in eastern Europe. (For Aff — Jul 1942)

EUROPE

War on land. I. Europe. (A Quar — Apr 1942)

F

FAR EAST

War on land: III. The Far East. (A Quar — Apr 1942)

FORMOSA

Can Japan count on Formosa? (Asia — Jul 1942)

FORTIFICATIONS

Attack of a German fortified position. [See "Foreign Military Digests" Section]
Concerning fortification. (Ejercito — Dec 1941)
Concrete in fortifications. (Ejercito — Nov 1941)
Hasty field fortifications. (Inf Jour — Jun 1942)
How the fortified fronts were broken through. (Ejercito — Feb 1942)

FRANCE (ARMY OF)

Causes of French defeat in 1940. (Voj Roz — Apr 1942)
Defense is no defense. (Town & Country — Aug 1942)
The Potez 161. (Aero — 22 May 1942)

FRANCE (NAVY OF)

French fleet in this war. (Nav Inst Proc — Aug 1942)
Naval history of Martinique. (Nav Inst Proc — Aug 1942)

FRANCE (FREE)

South Sea Isle of Mineral Mountains. (Nat Geog — Jul 1942)
War awakened New Caledonia. (Nat Geog — Jul 1942)

G

GEOGRAPHY (MILITARY)

Alaska — Our spearhead in the Pacific. (Sci Dig — Aug 1942)
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GERMANY

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Sources of Germany's might. (Harper's — Jul 1942)

GERMANY (ARMY OF)

Command and Staff

The "Fuehrer's" general staff officers. [See "Foreign Military Digests" Section]

Organization and Equipment

Characteristics of enemy aircraft. (A Off — Jun 1942)
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Supply

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Training

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How the Germans took Fort Eben Emael. (Inf Jour — Aug 1942)

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Policy and strategy in the war in Russia. (For Aff — Jul 1942)

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Tactics of artillery. With special reference to the Germans. (Jour R Art — Aug 1942)

The ear of the German army. [See "Foreign Military Digests" Section]

GREAT BRITAIN

Ethiopia — silent partner. (Asia — Jul 1942)

GREAT BRITAIN (ARMY OF)

Auxiliary Military Forces

This is a woman's war. (Inf Jour — Aug 1942)

Mobilization

Artillery recruit training. (Jour R Art — Jul 1942)

Home guard. (Jour RUSI — May 1942)

Command and Staff

A brains' trust for the army. (Roy Eng Jour — Jul 1942)

A combined general staff. [See "Foreign Military Digests" Section]

Coastal command. (Jour RUSI — May 1942)

High command. (Round Table — Jun 1942)

Organization and Equipment

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Dornier Do 217 E1. (Aero — 26 Jun 1942)

Escapes: III. — Fighter planes and pilots take hard knocks. (RAF Quar — Jun 1942)

Home guard. (Jour RUSI — May 1942)

Hygiene in the army. (A Quar — Apr 1942)

"Mixed" batteries. (Jour R Art — Aug 1942)

Motor cycles for military engineer purposes. (Roy Eng Jour — Jun 1942)

"On behalf of the 25-PR." (Jour R Art — Aug 1942)

On seadromes. (Aero — 1 May 1942)

Reconnaissance corps. (Ftg Forc — Apr 1942)

Regimental organization. (Jour R Art — Aug 1942)

Services of the artillery in Burma, Malaya, and the Dutch East Indies during the last century. (Jour R Art — Aug 1942)

Shortcomings of commercial steam disinfection apparatus. (Roy Eng Jour — Jun 1942)

Torpedo-bomber. (Aero — 26 Jun 1942)

Personnel

Propaganda and the soldier. (Roy Eng Jour — Jun 1942)

Women flight mechanics. (Aero — 1 May 1942)

RMS

England's "Death and Glory Boys" who deactivate unexploded bombs. (Readers Dig — Sep 1942)

Schools

School for glider pilots. [See "Foreign Military Digests" Section]

Training

Action at Arras. (Ftg Forc — Jun 1942)

Artillery recruit training. (Jour R Art — Jul 1942)

Bombing: policy and practice. (Aero — 8 May 1942)

British air attaché reveals bombing details. (Amer Def — Jun 1942)

British parachutists. (Jour RUSI — May 1942)

Commandos and their raids. (Ill Lon News — 2 May 1942)

Construction of an army. (Inf Jour — Jul, Aug 1942)

Escapes. III. — Fighter planes and pilots take hard knocks. (RAF Quar — Jun 1942)

Home guard. (Jour RUSI — May 1942)

Hunting and training for war. (Roy Eng Jour — Jun 1942)

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"Mixed" batteries. (Jour R Art — Aug 1942)

Notes on the war in the air. (Ftg Forc — Jun 1942)

On issuing and receiving verbal orders. (Ftg Forc — Jun 1942)

Retreat from Libya. [See "Foreign Military Digests" Section]

Retreat to Egypt. (Aero — 26 Jun 1942)

Road to Dunkirk. (FA Jour — Jul 1942)

School for glider pilots. (Aero — 3 Jul 1942) [See also "Foreign Military Digests" Section]

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GREAT BRITAIN (NAVY OF)

Fighting the U-Boat. A vigil from Iceland to Gibraltar. (Times [London] — 15 Jul 1942)

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Naval necessities. (Ftg Forc — Jun 1942)

On seadromes. (Aero — 1 May 1942)

Storming of Madagascar. How the naval base was taken. (Times — 20 May 1942)

When the Repulse went down. (Lib — 6 Jun 1942)

GUAM

Guam — Before December 1941. (Nav Inst Proc — Jul 1942)

Pacific Islands. (Geog Rev — Jul 1942)

GUERRILLA WARFARE

Guerillas on the sea routes. (Aero — 16 May 1942)

Guerilla warfare. (Inf Jour — Jun 1942)

I

INDIA

Arms manufacture in India. (A Ord — Jul-Aug 1942)

Indian note book. (RAF Quar — Jun 1942)

Lands and peoples of India. (Mil Eng — Jun 1942)

Oriental siege. (Mil Eng — Aug 1942)

INDIAN OCEAN

Guerrillas on the sea routes. (Aero — May 1942)

READER'S GUIDE AND SUBJECT INDEX

INFANTRY

Organization and Equipment

Concerning the infantry sapper. [See "Foreign Military Digests" Section] Divisional infantry. (Ejercito — Jan 1942) German light infantry division. [See "Foreign Military Digests" Section] Howitzers against Soviet tanks. (FA Jour — Aug 1942) Medical soldier and the infantryman. (Inf Jour — Jul 1942) Present-day infantry. (Ejercito — Dec 1941)

Training Tactics

Artillery-Infantry cooperation. [See main article section] Cooperation between artillery and infantry heavy weapons. (FA Jour — Jun 1942) Destruction of an army. (Inf Jour — Aug 1942) Infantry. Class Instruction. (Ejercito — Mar 1942) Infantry and artillery — Their cooperation in the Italian army. (Ejercito — Nov 1941) Present-day infantry. (Ejercito — Dec 1941)

INTELLIGENCE (MILITARY)

Combat intelligence training in the new divisions. [See main article section] Intelligent intelligence training. (Inf Jour — Jun 1942) Make the most of your prisoners. [See main article section] Notes on essential elements of information and indications. [See main article section] Observations made during the campaign on Luzon. [See main article section] They say. (Inf Jour — Jul 1942)

INTERNATIONAL POLICE FORCE

The role of sea power in international policing. (Ftg Force — Jun 1942)

INTERNATIONAL RELATIONS

Russia and the world. (Ftg Force — Apr 1942)

IRELAND

Ireland to-day. (Round Table — Jun 1942)

ITALY (ARMY OF)

Characteristics of enemy aircraft. (A Off — Jun 1942) Destruction of an army. (Inf Jour — Jul, Aug 1942) Infantry and artillery. Their cooperation in the Italian army. (Ejercito — Nov 1941) Italian air strength. (Aero — 12 Jun 1942) Italian parachute raid. (Roy Eng Jour — Jun 1942) Torino auto-transport school division No. 52. (Ejercito — Jan 1942)

J

JAPAN

How strong is Japan? (Mil Af — Spring 1942) If Japan and America fight. [See main article section] Japan's Alaskan strategy. (New Rep — 29 Jun 1942) This is Japan. (A Off — Jun 1942) Unknown Japan. (Nat Geog — Aug 1942) Will Japan drive westward? (Asia — Jul 1942)

JAPAN (ARMY OF)

An army without machines. Successful Japanese methods in Burma. (Times [London] — 27 May 1942) Characteristics of enemy aircraft. (A Off — Jun 1942) Great zero mystery. (AF News Let — Jul 1942) Japanese army. (MC Gaz — Jun 1942) Japanese discipline, confucianist and feudal. [See main article section] Japanese grand strategy. (Cav Jour — May-Jun 1942) Japanese mechanization. (MC Gaz — Jun 1942) Japanese military terms and characters. (MC Gaz — Jun 1942) Japanese principles of antitank defense. [See "Foreign Military Digests" Section] Japanese tactics and materiel. (CA Jour — Jul-Aug 1942) Japanese tanks. [See "Foreign Military Digests" Section] Japan's timetable of Pacific conquest prophetically outlined. (U.S. Air Services — Jun 1942) New Japanese fighter. (Aero — 26 Jun 1942) What Japan plans. The major effort of this year. (Times [London] — 15 Jul 1942)

JAPAN (NAVY OF)

Japanese grand strategy. (Cav Jour — May-Jun 1942) Japanese naval terms. (MC Gaz — Jun 1942) Japan's losses at sea. (Asia — Jul 1942) Japan's timetable of Pacific conquest prophetically outlined. (U.S. Air Services — Jun 1942) Mitsubishi OO. (Aero — 15 May 1942)

L

LANDING OPERATIONS

Japanese landing operations. (MC Gaz — Jun 1942)

LARGE UNITS

Corps

Army corps artillery. (Ejercito — Feb 1942)

Division

Antitank defenses of a Soviet rifle division. (Cav Jour — Jul-Aug 1942)

Cavalry still potent weapon Soviets prove. (Cav Jour — July-Aug 1942)

Combat intelligence training in the new divisions. [See main article section] Divisional infantry. (Ejercito — Jan 1942) German light infantry division. [See "Foreign Military Digests" Section]

LATIN AMERICA

How Latin Americans die. (Harper's — Jul 1942)

LAW (MILITARY)

Justice in a war-time army. [See main article section]

LEADERSHIP

Leadership. (Cav Jour — May-Jun 1942)

Leadership. (FA Jour — Jun 1942)

Leadership. [See main article section]

Leadership rating of engineer officer candidates. (Mil Eng — Aug 1942)

Morale. (Our Army — Jul 1942)

Some thoughts on unit welfare. (A Quar — Apr 1942)

Thoughts for newly-appointed officers. (Cav Jour — Jul-Aug 1942)

M

MACHINE GUN

Machine-guns in defence. (An Cos — May 1942)

Modern technique of machine gun employment. (Difesa — Jun 1942)

Policy and strategy in the war in Russia. (For Aff — Jul 1942)

Super-machine guns. (Cav Jour — May-Jun 1942)

MADAGASCAR

Guerrillas on the sea routes. (Aero — 15 May 1942)

MALAYA

The services of the artillery in Burma, Malaya, and the Dutch East Indies during the last century. (Jour R Art — Aug 1942)

MALTA

Guerrillas on the sea routes. (Aero — 15 May 1942)

MANEUVERS

Armored reconnaissance. (Cav Jour — May-Jun 1942)

Gas on the ground. (Q.M. Rev — May-Jun 1942)

Station hospital during the Louisiana maneuvers. (Mil Surg — Jun 1942)

Survey of the accidents resulting from army maneuvers with recommendations for their prevention. (Mil Surg — Jul 1942)

Through the mill. (FA Jour — Jul 1942)

Visit to the army of the U.S.A. (A Quar — Apr 1942)

MAP PROBLEMS

Estimate of situation and solution. (Rev Mil — Mar 1942)

MAPS

Notes on cylindrical world map projections. (Geog Rev — Jul 1942)

MARCHES

Hints and suggestions for the combat employment of army construction troops. [See "Foreign Military Digests" Section]

Motor marching by rail. (FA Jour — Aug 1942)

Motorized marches. (FA Jour — Aug 1942)

Motorized road marches. (FA Jour — Aug 1942)

MARINE CORPS

Almanacs of the marine corps. (MC Gaz — Jun 1942)

Wake Island. (MC Gaz — Jun 1942)

MECHANIZATION

Armored reconnaissance. (Cav Jour — May-Jun 1942)

Blackout driving beam. (A Mot — Jul 1942)

Japanese mechanization. (MC Gaz — Jun 1942)

Jeep. (Life — 20 Jul 1942)

Policy and strategy of the war in Russia. (For Aff — Jul 1942)

Reconnaissance corps. (Ftg Forc — Apr 1942) [See also Foreign Military Digests' Section]

Six-gun motorized batteries. (Ejercito — Mar 1942)

Some thoughts on the motorized division. [See main article section]

Sources of Germany's might. (Harper's — Jul 1942)

Super-tanks, developments leading to the new heavy weapon. (Cav Jour — May-Jun 1942)

Suppressors. (A Mot — Jul 1942)

Weapons while you wait. (Collier's — 25 Jul 1942)

MEDICAL SERVICE

Alcoholism in military service. (Mil Surg — Jul 1942)

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Army tuberculosis admissions during 1941. (Mil Surg — Aug 1942)

A.S.H. faeces destructor and oil-and-water-flash fire burner. (Jour RAMC — May 1942)

Asthma in the English Army. (Jour RAMC — May 1942)

Central dental laboratory service. (A Dental Bul — Jul 1942)

Chigger and jigger bites. (Inf Jour — Jul 1942)

Cholera campaign. (Mil Eng — Jun 1942)

Dental health of the army. (A Dental Bul — Jul 1942)

Dental service at a camp station hospital. (A Dental Bul — Apr 1942)

Dental service with tactical units. (A Dental Bul — Apr 1942)

Divisional medical group in the field. (Ejercito — Jan 1942)

Drayman's life. (Jour RAMC — Jun 1942)

Enlisted assistant to the flight surgeon. (Mil Surg — Jun 1942)

Extracts from letters from a mobile surgical unit. (Jour RAMC — May 1942)

Field medicine and surgery. (A Dental Bul — Apr 1942)

Fight against venereal diseases. (Ejercito — Mar 1942)

Gastric disorders in the army. (Jour RAMC — Jun 1942)

General principles in the treatment of wounds and fractures in the Spanish War. (Mil Surg — Jul 1942)

Hinged box splint in emergencies. (Mil Surg — Jul 1942)

Hospital dental cart. (A Dental Bul — Jul 1942)

How soldiers are kept well. (Lib — 18 Jul 1942)

How to use your eyes at night. (Inf Jour — Aug 1942)

How war saves lives. (Lib — 8 Aug 1942)

Improved directing lamp. (Jour RAMC — May 1942)

Improvements in oil and water flash fire. (Jour RAMC — Jun 1942)

Improvised artificial pneumothorax apparatus. (Jour RAMC — Apr 1942)

Notings on the medical administration of an armoured division during active service. (Jour RAMC — May 1942)

Local treatment of burns in the army. (Mil Surg — Aug 1942)

Medical replacement training center, Camp Grant, Illinois. (Mil Surg — Aug 1942)

Medical service of the infantry division in offensive operations. (Defensor — May 1942)

Medical service with the horse-mechanized cavalry. (Mil Surg — Jun 1942)

Medical soldier and the infantryman. (Inf Jour — Jul 1942)

Modifications of Orr's hut. (Jour RAMC — May 1942)

Nature's way. III. The function of medical inspections. (Mil Surg — Jul 1942)

Observations on the first six months of the general surgical section of the 1500 bed cantonment type station hospital at Fort Leonard Wood, Missouri. (Mil Surg — Aug 1942)

Occupational therapy. (Jour RAMC — May 1942)

Organization and equipment of a physical therapy department for convalescent and general hospitals during war. (Mil Surg — Aug 1942)

Organization of a physiotherapy section at an army hospital. (Mil Surg — Jul 1942)

Pneumonia therapy with sulfathiazole in military practice. (Mil Surg — Jul 1942)

Prevention and control of infectious diarrheas among military forces. (Mil Surg — Jul 1942)

Professional service. (A Dental Bul — Jul 1942)

Quesada's method for the treatment of fractures in total warfare. (Mil Surg — Jul 1942)

R.A.M.C. hospital in Crete. (Jour RAMC — Apr 1942) [See also "Foreign Military Digests" Section]

Report of hospitalized cellulitis cases of dental origin. (A Dental Bul — Jul 1942)

Selection of the parachutist. (Mil Surg — Jul 1942)

Shortcomings of disinfection apparatus. (Roy Eng Jour — Jun 1942)

Station hospital during the Louisiana maneuvers. (Mil Surg — Jun 1942)

Surgical services of the Swiss army. (Mil Surg — Jul 1942)

Survey of the accidents resulting from army maneuvers with recommendations for their prevention. (Mil Surg — Jul 1942)

Treatment of painful feet in the army. (Mil Surg — Aug 1942)

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Use of the eyes at night. (Nav Inst Proc — Jun 1942)

Vision test card designed for use in examination for the armed forces. (Mil Surg — Jun 1942)

War in snow and extreme cold. (Inf Jour — Aug 1942)

Wartime concepts of the mobile field laboratory. (Mil Surg — Jun 1942)

MERCHANT MARINE

Provision of service personnel for manning the guns of merchant ships. (Ftg Forc — Jun 1942)

MEXICO

Mexico a belligerent. Vital strategic position between U.S.A. and Panama Canal. (Times [London] — 8 Jun 1942)

MIDDLE EAST

German preparations in the Middle East. (For Aff — Jul 1942)

Strategic communications in the Middle East. (For Aff — Jul 1942)

War on land. Middle East. (A Quar — Apr 1942)

MIDWAY ISLAND

Pacific Islands. (Geog Rev — Jul 1942)

Revenge off Midway. (AF News Let — Jul 1942)

MILITARY REVIEW

MILITARY HISTORY

An example of military history. (Rev Mil — Mar 1942)

MOBILITY

Axie opens its big 1942 drive. (Life — 20 Jul 1942)
Mobile artillery repair shops. (Ejercito — Apr 1942)
Notes on the war in the air. (Ftg Forc — Jun 1942)

MOBILIZATION

Drafting this army. (Harper's — Jul 1942)
Military and labor conscription. (Rev Mil — Apr 1942)
Military mobilization. (Rev Mil — Apr 1942)
Mobilizing American youth. (Atlantic — Jul 1942)

Industrial Mobilization

Military and labor conscription. (Rev Mil — Apr 1942)

MORALE

Factors in good morale. (FA Jour — Aug 1942)
Japanese army. (MC Gaz — Jun 1942)
Morale. (Our Army — Jul 1942)
Red Cross service program. (QM Rev — Jul-Aug 1942)

MOTORIZATION

Blackout driving beam. (A Mot — Jul 1942)
Convoy defense. (QM Rev — May-Jun 1942)
Development and maintenance of our chief military vehicles. (A Mot — May 1942)
Jeep. (Life — 20 Jul 1942)
Motorized marches. (FA Jour — Aug 1942)
Motorized road marches. (controlled) (FA Jour — Aug 1942)
The reconnaissance corps. [See "Foreign Military Digests" Section]
Six-gun motorized batteries. (Ejercito — Mar 1942)
Some thoughts on the motorized division. [See main article section]
Suppressors. (A Mot — Jul 1942)

MUSSOLINI

Between Hitler and Mussolini. (Harper's — Jul 1942)

N

NATIONAL DEFENSE

Civilians under arms. (An Cos — May 1942)

NAVAL WARFARE

Battle of the Coral Sea. (U.S. Air Services — Jul 1942)
Disembarking operations. (CA Jour — May-Jun 1942)
Guerrillas on the sea routes. (Aero — 15 May 1942)
Hide and seek warfare. (AF News Let — Jul 1942)
Naval actions, 1939-41. (Nav Inst Proc — Aug 1942)
Naval aerial menace number one. (Nav Inst Proc — Aug 1942)
Naval necessities. (Ftg Forc — Jun 1942)
New queen of the seas. (Nat Geog — Jul 1942)
On seadromes. (Aero — 1 May 1942)
Unknown British-American victory. (Nav Inst Proc — Aug 1942)
Wake Island. (MC Gaz — Jun 1942)
When the Repulse went down. (Lib — 6 Jun 1942)

NAVIES

Recent developments in airships. (Aero Eng Rev — Jun 1942)
Who should get the ships. (Fortune — Jun 1942)

NAVIGATION (AERIAL)

Effects of low temperatures on aerial navigation. (Rev Mil — Mar 1942)

NEW CALEDONIA

Pacific Islands. (Geog Rev — Jul 1942)

NEWFOUNDLAND

Newfoundland in North Atlantic strategy. (For Aff — Jul 1942)

NIGHT OPERATIONS

How to use your eyes at night. (Inf Jour — Aug 1942)
Night battle for a populated point. [See "Foreign Military Digests" Section]
Night operations. (An Cos — May 1942)
The future of night attack. [See main article section]

O

OFFICERS

Age and field command. (Mil Af — Spring 1942)
[See also main article section]
Officers by mass production. (CA Jour — May-Jun 1942)

Youth, middle age and old age. (Ejercito — Jan 1942)

OBSERVATION

Organic air observation for field artillery. (FA Jour — Jul 1942)

OBSTACLES

Obstacles. (Ejercito — Mar 1942)
Red tanks overcome real obstacles. (Cav Jour — Jul-Aug 1942)

War in snow and extreme cold. (Inf Jour — Aug 1942)

Wire obstacles. (Ejercito — Dec 1941)

OCEAN AIR TRANSPORT

Air freight v. U-boat. (New Rep — 3 Aug 1942)
Clippers at war. (U.S. Air Services — Jul 1942)

OIL

Axis oil strategy. (Roy Eng — Jun 1942)
Fuel for the Australian base. (Asia — Jul 1942)
Petroleum, chemistry and war. (A Off — Jun 1942)
Russian Caucasus. (AF News Let — Jul 1942)

ORDERS

Concerning the giving of orders. (Rev Mil — Apr 1942)
On issuing and receiving verbal orders. (Ftg Forc — Jun 1942)

ORDNANCE

Arms manufacture in India. (A Ord — Jul-Aug 1942)
Battle of Libya. (A Ord — Jul-Aug 1942)
Bomb defense. (A Ord — Jul-Aug 1942)
Inspection and adjustment of the 105mm howitzer recoil mechanism. (Ord Serv — Jun 1942)
Key to arms production. (A Ord — Jul-Aug 1942)
Red army weapons. (Inf Jour — Aug 1942)
Reorganization of ordnance. (A Off — Aug 1942)
Revolution in artillery. (A Ord — Jul-Aug 1942)
Squad armament. (A Ord — Jul-Aug 1942)
Weapons while you wait. (Collier's — 25 Jul 1942)

P

PACIFIC

America at war. (For Aff — Jul 1942)
Haushofer and the Pacific. (For Aff — Jul 1942)
Situation in the Far East. (Ftg Forc — Apr 1942)
Victory through air power. (Readers Dig — Jul 1942)
Wake Island. (MC Gaz — Jun 1942)

PANAMA CANAL

Mexico a belligerent. Vital strategic position between U.S.A. and Panama Canal. (Times [London] — 3 Jun 1942)

PARACHUTES

British parachutists. (Jour RUSI — May 1942)
Disembarking operations. (CA Jour — May-Jun 1942)
Parachutes in Russia. (Sov Russia — Aug 1942)
Selection of the parachutist. [See main article section]

PERSIA

New land bridge to Russia. (Times [London] — 15 Jul 1942)

PHILIPPINE ISLANDS

America at war. (For Aff — Jul 1942)
Bataan nurse. (Collier's — 1 Aug 1942)
Battle for the Islands. (Inf Jour — Jun 1942)
Fall of Bataan. (Life — 20 Jul 1942)
Flight with Quezon. (Collier's — 1 Aug 1942)
Heroic defense of the Philippines. (Readers Dig — Jul 1942)
How they did it. (FA Jour — Jun 1942)
Military history of the Filipino people. (Mil Eng — Jun 1942)
Observations made during the campaign on Luzon. [See main article section]
Perimeters in paragraphs. (FA Jour — Jul 1942)
Quartermasters on Bataan performed heroic feats. (QM Rev — May-Jun 1942)

PHOTOGRAPHY

Aerial photographs. (Def Nac — Apr 1942)
Fall of Batan. (Life — 20 Jul 1942)
Jeep. (Life — 20 Jul 1942)
Luftwaffe development. Germany's new fighters and bombers. (Ill Lon News — 9 May 1942)
Second front? (Life — 27 Jul 1942)
South Sea Isle of mineral mountains. (Nat Geog — Jul 1942)

PHYSICAL FITNESS

Food for fighters. (Sci Amer — Jul 1942)
Hygiene in the army. (The A Quar — Apr 1942)
Physical education. (Ejercito — Jan 1942)
Selection of the parachutist. [See main article section]
Sports events for the army cavalryman. (Ejercito — Jan 1942)

PRINCIPLES OF WAR

Night operations. (An Cos — May 1942)

PROPAGANDA

Development of propaganda. (A Quar — Apr 1942)
Propaganda and the soldier. (Roy Eng Jour — Jun 1942) [See also "Foreign Military Digests" section]
Russian battle front. (Life — 20 Jul 1942)

PSYCHOLOGY (MILITARY)

German mass psychology. (A Quar — Apr 1942)
Military unit: an essay on military psychology. (Ejercito — Mar 1942)

Q

QUARTERMASTER SERVICE

Army foods — Army menus — reflect scientific selection and preparation. (QM Rev — Jul-Aug 1942)
Army menu. (QM Rev — Jul-Aug 1942)
Army's staff of life. (QM Rev — Jul-Aug 1942)
Dehydrated foods. (QM Rev — Jul-Aug 1942)

Development and operations of the Quartermaster market center. (QM Rev — Jul-Aug 1942)
Food's part in defense. (QM Rev — May-Jun 1942)
Gas on the ground. (QM Rev — May-Jun 1942)
Milk for the best-fed Army. (QM Rev — Jul-Aug 1942)

Non-perishable branch. (QM Rev — Jul 1942)
Packaging and packing of subsistence items for overseas shipment by the army. (QM Rev — Jul-Aug 1942)

Quartermasters on Bataan performed heroic feats. (QM Rev — May-Jun 1942)

Rations. (QM Rev — Jul-Aug 1942)
Ration breakdown board. (QM Rev — Jul-Aug 1942)

Ration in combat. (QM Rev — Jul-Aug 1942)
Subsistence. (QM Rev — Jul-Aug 1942)
Training bakers and cooks. (QM Rev — Jul-Aug 1942)

R

RED CROSS

The American Red Cross. (CA Jour — May-Jun 1942)

REPLACEMENTS

Relief of units during combat. (Rev Mil — Mar 1942)

RECONNAISSANCE

Attack of a German fortified position. [See "Foreign Military Digests" Section]

Horse sense. (Our Army — Jul 1942)

Landing near Boulogne. Reconnaissance by commando troops. (Times — 10 Jun 1942)

Reconnaissance SOP. (Inf Jour — Aug 1942)

The reconnaissance corps. [See "Foreign Military Digests" Section]
Why not the camera for reconnaissance? (Cav Jour — Jul-Aug 1942)

RIVER CROSSINGS

Comments on the forced crossing of the straits of Johore. (Rev Mil — Apr 1942)
German river crossing not according to plan. (Roy Eng Jour — Jun 1942)

River crossing in the eastern theater of war. [See "Foreign Military Digests" Section]

ROUTES COMMUNICATIONS

Airways

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S

SCHOOLS (CIV)

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 Cavalry training at Culver. (Cav Jour — May-Jun 1942)
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 Sky trucks coming. (Harper's — Jul 1942)

SWITZERLAND (ARMY OF)

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T

TACTICS OPERATIONS

Defensive Combat

Cavalry in the defensive battle. (Ejercito — Mar 1942)
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 Soviet cavalry operations. (Cav Jour — May-Jun 1942)
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Special Warfare

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 Japanese mechanization. (MC Gaz — Jun 1942)
 Japanese tanks. [See "Foreign Military Digests" Section]
 Men against machines. (An Cos — May 1942)
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 Red army weapons. (Inf Jour — Aug 1942)
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U

UNITED NATIONS

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 It can happen here. [See main article section]
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Training

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V

VETERINARY SERVICE

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 Quality of fresh milk. (Vet Bul — Jul 1942)
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W

WAKE

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MILITARY REVIEW

WARS

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The battle of the Ebro. Artillery action. (Ejercito — Dec 1941)

UNITED STATES

INDIAN CAMPAIGNS (1865-1901)

Revenge for Custer. (Pioneer — 29 May 1942)
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Aege and field command. [See main article section]
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Battle for the Islands. (Inf Jour — Jun 1942)
Battle of China. (Time — 2 Jun 1942)
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Russo-German war. (FA Jour — Jun, Jul, Aug 1942)
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Reconnaissance corps. (Ftg Forc — Apr 1942)
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